AN EVALUATION OF THE FEASIBILITY OF A COMPETENCY BASED TRAINING SCHEME FOR THE BHUTAN VETERINARY FIELD STAFF

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This thesis identifies the competencies required by the Veterinary Field Staff (VFS) in their workplace in Bhutan. Identification of the field needs was necessary because the Competency-based Training (CBT) is a form of training that derives its curriculum from the analysis of an actual or prospective role in a society. Based on the identified field needs, a sample curriculum is constructed for one section-surgery. This is to serve as an example for building the curricula for other competencies required in the VFS job.

The collection of information on their job competencies was achieved mainly through a mail questionnaire distributed to 150 VFS in Bhutan. This information was supplemented by informal interviews and discussions and by searching the Department of Animal Husbandry (DAH) records, field observations and some personal experiences.

The survey result showed that typically the VFS are young with less than 10 years service in the DAH. The main job competencies required were disease prevention and treatment, surgical operations and extension activities.

All the subjects taught in their basic training were needed by the VFS. The questionnaire revealed that some specific situations are not well covered, while others received more emphasis than is necessary. This thesis identifies these areas both by subject and by animal species involved.

The survey revealed a major need for improved extension delivery skills. Respondents favoured increased opportunity for in-service training as well as the provision of formal induction/orientation training. While 97% of the respondents wished to keep in contact with the Royal Veterinary Institute (RVI) staff during their service, many of them felt that their training and facilities at the RVI were less than satisfactory. These shortcomings were identified and

changes have been formulated in an instructional delivery system to improve the RVI's capability of teaching students in an environment conducive to learning.

Finally, a CBT curriculum based on the identified skill and knowledge needed for the subject surgery in the RVI has been developed. Assessment and detailed teaching criteria which could fit within the administrative and cultural needs of Bhutan are presented.

It is recommended that CBT be used as a means of improving training offered by the RVI in Bhutan. In this regard, three components of training need to be instituted. These are the formal pre-service training, an induction/orientation course and in-service training. All the training components need to be conducted based on identified field needs.

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List of Abbreviations

AT = Anaesthetic Technique
CBT = Competency-based Training
CRI = Criterion Reference Instruction
DAH = Department of Animal Husbandry
DAHO = District Animal Husbandry Officer
FIPSE = Funding Institute for Post Secondary Education
HLDP = Highland Livestock Development Project
HAADP = High Altitude Area Development Project
IFO = Institutional Facilities Oriented
OT = Operating Technique
RGOB = Royal Government of Bhutan
RT = Restraining Technique
RVI = Royal Veterinary Institute
ST = Sterilization Technique
TAFE = Training Agency and Further Education
TGO = Target Group Oriented
TTO = Teacher and Teaching Oriented
VC = Veterinary Compounder
VFA = Veterinary Field Assistant
VFS = Veterinary Field Staff
VI = Veterinary Inspector

Chapter 1

Introduction

1.1. Present condition of the Royal Veterinary Institute in Bhutan

Agriculture and livestock account for the livelihood of 85% of the population and provide 41% of the GDP in Bhutan (World Bank, 1989). Since Bhutan's effort to develop a modern economy, dating back to the early 1960s, one of the foci has been livestock development. The main emphasis in this development has been on the cross-breeding of animals, their improved health and the promotion of pasture and fodder development through the Department of Animal Husbandry (DAH). Realising that livestock development cannot be attained without technical administrative personnel, the Royal Veterinary Institute was established in the latter half of 1970. The main aim of the institute was to produce a technical support cadre which would perform competently at the farmers' level.

Since the establishment of the RVI, a considerable change has occurred in its structure (Tate, 1988a) and in the infrastructure of the DAH. The Veterinary Field Staff (VFS) numbers have been increased. Despite these changes, improvements in livestock development have been modest. There is no written record available to provide reasons for this low impact. However, it is clear from my own personal experience as a trainer in RVI and a member of DAH, that the training system in the RVI has remained confined to teaching only the knowledge component of the field needs. Curricula changes have not been instituted to meet the farmers' and the country's demands. As a consequence the competencies of the VFS have failed to meet the needs of the field, resulting in low developmental impact. The failure to change is clearly depicted by the continued use of the syllabus in the RVI developed in 1980 by Dr. Moorhouse, a UNDP curriculum development specialist.

Teaching and learning is confined to the four walls of the classroom, with little of the practical training which the VFS need. Seldom are practical sessions performed by the trainees because of the belief that observation would be sufficient. Lectures form the major method of teaching in the RVI and usually it is a one way system where trainers deliver and trainees take the instruction. This is a most ineffective method of learning (Geoffrey Moss, 1989). Visual aids such as film projectors, slides and overhead projectors are available but insufficient funds mean they cannot be used. Many are non-functional because they have been mishandled. The trainers

also fail to encourage the trainees to discuss issues in the class and fail to make them realise that learning can be trainee centered. There is also a need to break the social barrier between the trainers and trainees to create an environment conducive to learning.

1.2. Basis of the study

The need for a systematic training system is evident. Bhutan is developing fast. This development is changing the needs of the people and the country. In trying to meet the changing needs, training will continue to be a very important part of DAH activities. DAH will only sustain the development process effectively by training its VFS competently. The present system of training fails because little or no progress has been made by curriculum developers in defining the training needs of the DAH as perceived by those who make use of the skills and knowledge. A need for a well-designed training system based on analysis of the field requirements is evident. There is a need to change the instructional methodology and create a learning environment which helps effective and efficient learning. Finally, a dynamic training system is required, capable of adjustment to the current and emerging needs of the farmers and the country.

To improve the present training system in the RVI, I have attempted to present the logic behind CBT. This has been done by reviewing relevant literature, by presenting the results of field surveys and by building a sample curriculum based on these results.

1.3. Basic aims of the study

The aims the study are to:

1.3.1. identify the training needs of the VFS

1.3.2. use these needs as the basis for formulating a CBT programme

1.3.3. examine how a good CBT programme can be adapted to fit the the administrative and cultural needs of Bhutan.

The specific objectives are to:

1. Identify the competencies needed in terms of skills and knowledge of the VFS.
2. Design a sample curriculum based on the identified needs as per the requirements of the CBT approach.
3. Consider the implications of CBT on the RVI.

The sources of information were:

1. mail questionnaires to the VFS of Bhutan
2. informal interviews and discussions with the DAHOs and senior officials of the DAH
3. research of the DAH records
4. personal experiences.

1.4. Structure of the thesis

The thesis is presented as follows:

Chapter 1: A general view of the RVI training conditions, and the aims and objectives of the study.

Chapter 2: A summary of the literature review on CBT and some research findings supporting the success of CBT.

Chapter 3: Survey methods and analysis.

Chapter 4: The results of the survey.

Chapter 5: Discussions on the salient findings of the survey.

Chapter 6: A subject curriculum (surgery) based on the skills and knowledge requirements identified in the survey results.

Chapter 7: A general discussion dealing with implications of CBT on the RVI and the conclusions and recommendations.

Chapter 2

Literature Review

2.0. Overview of Competency-Based Training (CBT)

The competency-based approach to training is an innovative educational tool which has been developed in the last 2 or 3 decades. The central concept of this system of training is its specification of learning outcomes based on successful functioning in life roles; these outcomes are independent of time and certification is based on pre-set criteria (Gamson, 1979). This system aims at managing learning and instruction by allowing students to proceed at their own pace and letting them use a wide variety of materials relevant to meeting the objectives. This is unlike the traditional system where emphasis is on lecture or classroom instruction. CBT focuses on developing learning objectives and preparing materials other than lectures which the trainees can use to instruct themselves. It encompasses other desirable characteristics such as individualised instruction, field setting of learning, immediate feedback etc. A competency-based approach incorporates many psychological bases for learning.

Mager and Pipe (1983) differentiated CBT from Criterion-Reference Instruction (CRI). They stated that CRI is derived from the real world needs and tests required to match the objectives, while CBT tends to be more academic in nature. However, much of the literature does not agree with this differentiation.

Zemke (1982) states that Blank contends that the competency-based (CB) approach is not new and has existed under a multitude of different names. They are Mastery Learning, Systems Approach to Education, Criterion Referenced Instruction and Self-paced Learning (Zemke, 1982 ; Anon, Training terms, 1985). Later, Zemke (1984) in The Training Terms describes competency-based and criterion-referenced approaches as two different words for the same thing. Gamson (1979) mentions CBT as sharing features of other educational innovations such as Self-paced Instruction or Experiential Assessment. However, he also states that CBT is unique in that it puts all these features together.

The literature on these methods of training requires all to have pre-specified objectives. Students are made aware of what they are expected to do and achieve. Instruction is by self-paced, individualised methods. A student's progress is measured in terms of achievement of the

objective. After reviewing the literature for CBT it seemed appropriate to treat CRI, Mastery learning and CBT/performance-based training as being the same because no substantial difference could be found among them.

2.1. Development of CBT

2.1.1. CBT in the United States

The development of CBT can be traced back to the 1920s when educational reforms of industrial and business models centered on specification of outcomes in behavioural objectives form. However, the competency movement under its specific label has existed only since the early 1960s in the USA (Tuxworth, 1989). There is no doubt that CBT has a variety of antecedents such as efficiency in education, vocational education, progressive education and instructional technology. The specification of outcomes in behavioural objectives was important during the two World Wars. The importance of mastery learning and performance testing for assessment was stressed because war time did not allow partial learning; it was essential to learn completely and quickly. The only method to find the level of mastery was through performance testing (Neuman, 1979), which determined the final outcome of every training course. This has left an indelible mark on CB approaches and American education. Also, ideas from the developmental psychology of youth had a powerful impact on the development of the concept of a competency-based approach. The demand in the early 1960s in the USA for educational accountability, due to an increased emphasis on the USA's economy and more community involvement in decision making, also gave impetus to the development of competency-based educational training (Reismann, 1979).

It is agreed by most writers that the root of a CB-approach is in teacher education which helps develop the conceptual and theoretical background (Elam, 1971, Bruke *et al.*, 1975, Houston, 1980). Developments have now extended to elementary schools and vocational education in many states of the USA. Funding Institute for Post Secondary Education (FIPSE) is said to be responsible for widespread adoption of the competency-based approach outside teacher education, because it was the funding agent for research in many parts of the USA.

2.1.2. CBT in the UK

CBT in the United Kingdom arose from a series of white papers which specified necessary outcomes of training (City and Guilds, 1982; Tuxworth, 1989). By the early 1980s CBT took a firm hold in the UK. CBT is now being widely tried and has had a pervasive effect on some stages of education and vocational education and training.

2.1.3. CBT in Australia and New Zealand

In Australia CBT gained ground due to the TAFE initiation in the early 1980s. It has been tried in such diverse areas as teacher education, industrial staff development, and training for panel beating, wool classing and spray painting (Harris *et al.*, 1985). In New Zealand it also emerged in the early 1980s, prior to which it was thought to be a radical educational approach. It is used successfully in logging, fencing, and dairy training (QA News, 1990). There are few published papers available on CBT's impact in New Zealand, but it is becoming popular in polytechnics (QA News, 1991).

2.2. Definition and approach to CBT

In defining CBT, it is important to know about trainees' learning processes and their assessment in order to demonstrate it to a skeptical outsider. Due to a great diversity in the ways CBT is implemented and assessed, it is rather difficult to come to a precise definition for CBT (Grant, 1979). However, boundaries can be identified that define CBT. Researchers Grant *et al.* (1979) in the USA define it as:

"a form of education that derives a curriculum from an analysis of a prospective or actual role in modern society and that attempts to certify students' progress on the basis of demonstrated performance in some or all aspects of that role. Theoretically, such demonstrations are independent of time served in formal educational settings".

The definition used by TAFE National Centre for Research and Development of Australia (1983) states:

"an educational system that emphasises the specification, learning and demonstration of those competencies (knowledge, skills, attitude/behaviours) that are of central importance to a given task, activity or career."

The definitions above depict traits of CBT, but there is some divergence in the literature on the precise characteristics (Grant *et al.*, 1979; Harris *et al.*, 1985). Norton *et al.* (1980) in defining Competency-based Vocational Education have come up with 5 essential and 7 desirable characteristics (See Fig. 2.1).

Fig.2.1. Characteristics of Competency-Based Training

A Essential Characteristics:

1. Competencies to be achieved by the students have been:
   a carefully identified
   b verified by local expert
   c made public.
2. Criteria for assessing each of the verified competencies have been:
   a derived from analysis of the competencies
   b explicitly stated along with conditions
   c made public
3. Instruction programme provides for the:
   a individual development of each competency
   b individual assessment of each competency
4. Assessment of students' competency:
   a takes knowledge into account
   b takes attitude into account
   c requires actual performance of the competency as the major source of evidence
5. Students progress through the programme:
   a at their own rate
   b by demonstrating their competence

B Desirable Characteristics

1. Instruction is individualised to the maximum extent possible
2. Learning experiences are guided by frequent feedback
3. Emphasis is upon student's achievement of exit requirements
4. Instruction is individually paced rather than time-based
5. Instruction is field centered using realistic work situations and actual on-the-job experiences
6. Instructional materials are:
   a modularised
   b mediated
   c flexible with both required and optional learning activities provided
7. The instructional programme as a whole is carefully planned and systematic-evaluation data are used for programme improvement.

Norton's CBT characteristics set a pre-condition for CBT to exist as an operational entity. To summarize Fig. 2.1.: any training programme which attempts a CB-approach must have

clearly defined objectives derived from the real needs of the functioning roles of the job for which the training is being planned. The programme must be individualised as far as possible and assessment must take into account knowledge, skill and attitude by actually requiring the trainee to perform in the assessment in a real or simulated setting (Jessup, 1989). Thus it is a training programme with clear definition of purposes, frequent feedback, use of varied materials and resources for instruction and mastery of occupationally relevant knowledge, skills, and attitudes (Zemke, 1980, Harris, 1982b, Wilson, 1987b). The assessment is designed to provide feed-back to the students frequently and enable trainers to check on the efficiency and the need for further improvement of the training programme.

2.3. Advantages and disadvantages of CBT

The competency-based approach is an individualised program of learning experiences concentrating upon the attainment of role-derived competencies in actual situations. It has advantages over the traditional system of education because it caters for an individual's needs and allows trainees to work at their own pace, thus making the learning trainee-centred. The traditional method of instruction emphasises what a trainer wants of a trainee. Instruction is confined to the classroom and often becomes a show-place for the trainer rather a useful experience for the learner.

2.3.1. Advantages of CBT

CBT is a procedure that puts into practice the idea which Mager & Pipe (1983) describe as " if you know where you want to go and have a way of determining when you get there, you will be more likely to arrive at your destination". Moreover, there is a significant psychological basis for CBT's success as a training tool. This has been described by Norton *et al.* (1980) as follows:

1. Students need structure and direction for learning.
2. Students learn at different rates.
3. For best results, content should be sequenced and handled in small amounts.
4. Students' interests and motivation vary.
5. Learning needs active participation.
6. Learning should be successful for continued learning.

Blank (1980) provides other important educational and management advantages summarized from research findings and from what he labels as "common sense". He states that CBT:

1. gives each student enough time to master each competency before moving to the next
2. shortens training time for some students
3. meets the needs of special learners more effectively (through a built-in feedback system)
4. reduces failure, and early success can reduce absenteeism, tardiness, the attrition rate and behavioural problems
5. enables educational institutions to offer open entry, open exit, self-paced programmes
6. allows proficiency to be held constant and at high levels and allows individual training time to vary
7. is preferred by students, who, through the experience, enjoy the challenge and freedom to take responsibility for their learning
8. promotes greater accountability of students, teachers and training programmes
9. results in more effective articulation among educational institutions through clearly stated competency statements and program parameters
10. keeps students task oriented and active, just like the real world

2.3.2. Disadvantages and criticisms

Some criticisms of CBT often occur from what Mager & Pipe (1983) call "simple lack of knowledge or the presence of mis-information". However, there are two critical issues (Tuxworth,1989) which could be seen as demerits of CBT. These issues are as follows:

1. The conception and definition of competence remains inadequate. The job analyses are discrete elements. Thus analysis may not encompass all the competence the trainee may need to perform in the real world situation. Factors such as the social contact and condition of the working situation will come into play which may have an effect on the competence. In this respect the definition of competence depends on the institutional or organizational perception of competence for the particular job or task.

2. There is only limited research evidence that CBT is superior to other educational or training in terms of output. It only has face and content validity (competence are pre-defined and trainees pass-out only after competence levels are achieved) but does not possess predictive validity. This is not only characteristic of CBT, for other training programmes cannot predict how well the person is going to perform after the course is completed.

2.4. Curriculum development in CBT

Nicholls and Nicholls (1978) define curriculum development as planning of learning opportunities intended to bring about certain changes in students with assessment of the extent to which these changes have taken place. The curriculum consists of objectives and description of the content, method (learning and teaching) and evaluation procedures.

There are many ways to develop a curriculum. They are generally classified into four, viz:

1. in-house review:- development of curriculum by an individual or group within the institute.
2. formation of small group of experts:- development of curriculum by a group of subject matter specialists or by experts
3. peer review and market research:- development of curriculum by analyses of the people performing the job and the type of qualification required by the prospective employee (Lee *et al.*, 1982).

Competency-based curricula focus on the specification of clear objectives by subdividing each job/role into its elementary operations (skills, knowledge and attitude), identifying the desired outcomes of the training and certifying the trainees on the basis of demonstrated competence of the pre-set criteria.

In analysing the job it must be realised that each activity is a part of a larger system and is affected by the latter. This means that the job is performed in an environment and many factors contribute to or affect its proper functioning. Thus the first step in a job analysis is to describe, analyse and review the relevant operation system within which the job is performed. This involves observations of exemplary performers, interviews with the people involved and the trainees (Grant, 1979). The job is then broken down into different duties and the duties to tasks and the tasks to elements or units (Davies, 1973; Pipe, 1975). In a training setting, a task can

form a course. For example, the task of the VFS to perform surgery can be taught as a course consisting of many units.

Mansfield (1989) argues that task analysis alone is inadequate. This is because as the occupational role increases in complexity and responsibility the competence required is hard to envisage as a result of the type of interaction a person needs to perform a job in a given circumstances. For example, a DAHO's role is more complex than the VFA because a DAHO besides performing his duties also needs to interact with different dzongkhag (district) officials. A VFA has specific skills and knowledge requirements and the types of interactions are less complex. The task analysis is sufficient in the lower occupational structure where specific skills and knowledge are required to perform the job. This seemed suitable for VFS in Bhutan as their jobs have specific knowledge and skills requirements.

This task analysis helps in synthesizing what Gilbert (1962) calls a "hierarchical organization" which is relevant to the writing of a "learning prescription" (Davies, 1973). This helps the instructor to provide the learning materials in sequence or modular form which in turn helps trainees to proceed with learning from known to unknown or simple to complex (Mager, 1975; Pipe, 1975). In providing sequential training it automatically calls for self-paced, multi-media courses as a substitute for or addition to the formal classroom presentation, because students have to satisfy the requirements of a given learning level before they proceed to the next level. The sequencing of the learning materials will also demand integration of instructional programmes by appraising inter-relationships among the courses (duties or tasks) to develop the total curriculum. Because CBT emphasises outcome it gives greater accountability in terms of its ability to produce trainees who are employable, socially useful and productive (Mather *et al.*, 1977).

2.5. Evaluation/assessment in CBT

Evaluation is important in all training programmes because it helps in personal growth of the students by helping them to monitor their performance and capability through a form of feedback. It is a way of crediting and recognizing their learning. It also helps in programme development, renewal and control of the quality of the training programme (Heydinger, 1975). Evaluation is of major importance in a competency-based training process because of the need to measure the attainment of the pre-stated objectives before proceeding to the next unit. Hence there is a need for constant feedback to check the progress of the students' competence.

Moreover, evaluation in competency-based programmes is used to develop and control the quality of the training by checking the standard and process of training.

The vastness of available literature on educational evaluation is demonstrated by King (1979), who has differentiated the terms used to denote evaluations for different purposes. However, he concludes that there exists some consensus on the basis of a CBT programme's assessment. Literature on competency-based programmes by Burns (1972), Oen (1985), Hymel (1986), and Seitz (1986) also show agreement on the need to use criterion-referenced evaluation/assessment.

The requirement for a form other than paper and pencil assessment alone is quite vividly brought out in the above literature. Because the CB-programmes seek to measure students' behavioural changes through pre-specified objectives, matching the assessment with objectives seems essential. Assessment must also provide training accountability by being able to tell what the trainees can do after they finish a curriculum. The assessment in a CB-programme must emphasize performance and task completion, as the trainees have to attain the stated objectives before proceeding to the next unit. A formative evaluation which stresses feedback to the students and techniques involving self-assessment or peer-assessment is also indicated. It is preferable to use criterion-referenced assessment which uses a fixed standard rather than measuring against a standard of others, as in norm-referenced assessment (King, 1979; Wilson, 1987a & b). An added advantage is that the criterion-referenced evaluation pins down the training problems in terms that the organization can understand, approve and value in the programme because the assessment matches the objectives. The reasons above suffice to support the use of criterion-referenced assessment for the CB-programme.

2.5.1. Role of evaluation in CBT

Evaluation is an intrinsic part of the CB-programme (Stanton, 1989). The model in Fig. 2.2. explains the role of evaluation in CB-programmes and its intrinsic property in CB-approaches and quality control.

The model shows the cycle of the three components:- standard, process and evaluation. In CBT students begin training with a standard stated in an objective. The objective is realised through a process which can be any form of teaching/learning. To test if the pre-specified standard is reached, an evaluation is undertaken.

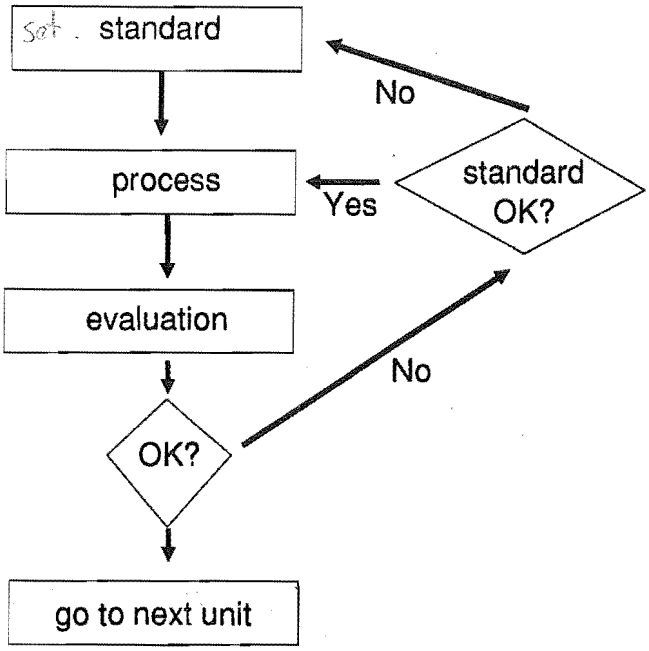


Fig.2.2. The role of evaluation in CBT

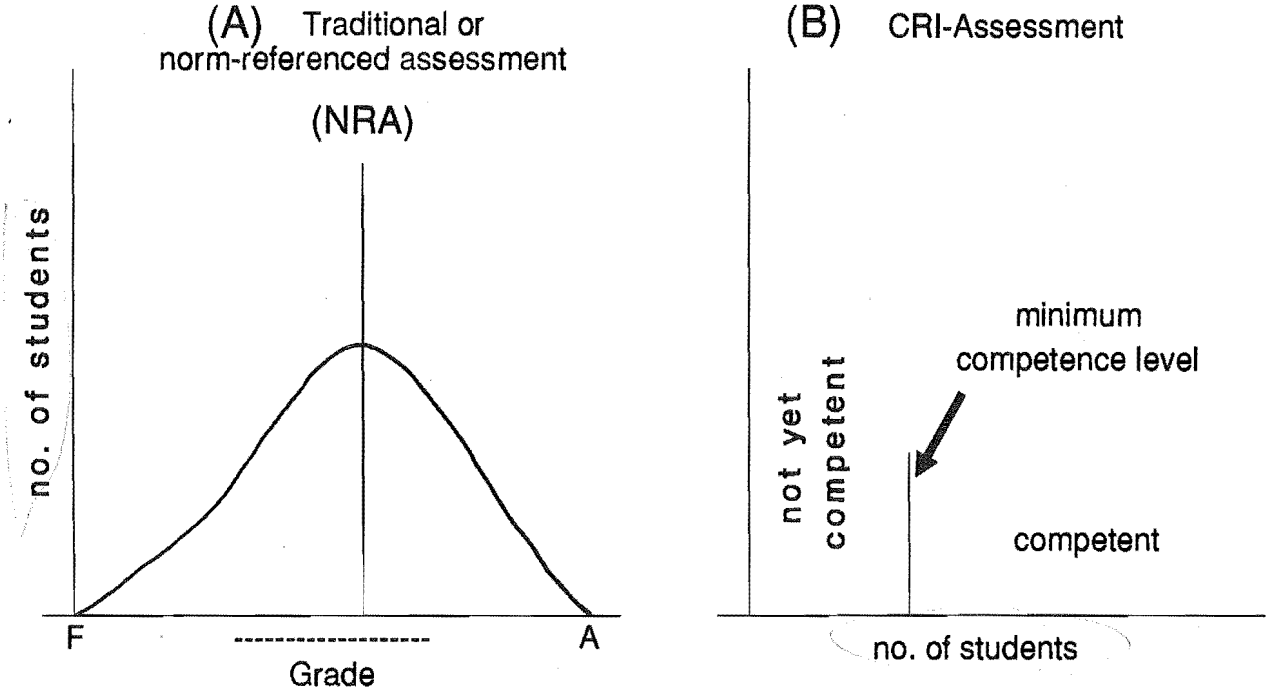


Fig.2.3. Comparison between NRA and CRI grading.

The role of evaluation in this particular context is to give a form of feedback to both the teacher and students. The feedback to a particular student is whether (s)he is able to meet the objective after learning has taken place. If (s)he fails to perform to the pre-specified standard, the student is not allowed to move on to the next unit or to exit with a competence certificate. (S)He is made to repeat until the standard is attained.

The feedback that the teacher obtains from this assessment is mostly on the standard and process. If the majority of the class fail, then it is possible that either the standard is too high or the process of the teaching/learning is inappropriate. The teacher has then the option to investigate the standard and see if it is realizable; if it is, then it is necessary to look at the teaching/learning process which may need some alteration in the methodology and/or resources. The above statement clearly indicates how evaluation in CB-programme provides constant feedback to assess the realization of objectives and progression of the students. In this respect CR-assessment seems to be an appropriate tool for evaluation in competency-based training.

2.5.2. Technique for criterion-reference (CR) assessment

CR-assessment emphasizes the actual task performance (Oen, 1985; Wilson, 1987a & b). Students must complete the real task in an environment and using the equipment as close to the real world as possible. Checklists with pre-stated standards are used to evaluate the students and test items needs to match the objectives (Mager, 1973). Cognitive knowledge is ascertained by a written test.

Grading in CR-assessment is according to the attainment of the objective. The grade provided is "competent" or "not yet competent" (see Fig. 2.3.B). In norm-referenced assessment the grade takes a normal distribution as shown in the Fig. 2.3.(A). There are a large number of students in middle grades i.e. B and C and a few students with A and F grades. CR-assessment has a large number of students in the "competent" side and a few in the "not yet competent". However, it needs to be mentioned that among the competent group the competency level may vary and students going out of the course will be able to perform at varying degrees, as there is no ceiling to the higher competency level other than the minimum required to perform a task. The graphs in Fig. 2.3. will help differentiate and better understand the grading system in the above-mentioned assessments.

Another form of evaluation used by a Canadian community post- secondary school called Holland College is the numerical scale representing the kind of quality (accuracy), quantity (time taken) and amount of supervision required of the worker (see appendix I). The rating is provided on the basis of the students' performance compared to job requirements in industry. The rating scale covers a wide range of skill ability, from no experience at all to highly skilled performance graded in seven steps (Maginn, 1978). This rating scale would be of greater use for the on-the-job evaluation than in the institution, as it could be used to identify the training/practice needs of the people on-the-job. Further, it only looks into the skill aspects of the job.

2.6. Research literature on CBT

Limited research literature was found on CBT effectiveness. Available literature described more the development of the programmes (Harris *et al.*, 1985; Bruke, 1989). In CBT's early stages success had been exclusively based on what observers saw or thought to be operating (Knaak, 1977). However, Mager and Pipe (1983) suggest common-sense reasons for adopting CBT. The reasons are:

1) if what one teaches is important, it would seem important to know how well and with how many students one is succeeding.
2) to have a measuring instrument that measures what is important, rather than measuring merely that which is covered.
3) making students aware of what is expected will help make better decisions about how to attain the outcome.

Besides these common-sense reasons, they cite evidence from the American Institute of Research (AIR) project by David *et al.* (1968) which states that programs with stated objectives and individualised instruction are more successful than those without pre-stated objectives. Furthermore, AIR project analysis has found that the addition of personnel, services or equipment is of no advantage unless carefully integrated with program objectives. It is clear from this that the stating of objectives has a major role in the success of a programme. If this is true, CBT could be an ideal programme to use because it stresses establishing well stated objectives.

Walberg *et al.* (1979) have conducted analyses on successful innovative changes in learning from 1969 to 1979. Many features of these innovative changes which resulted in positive learning are also characteristics of CBT. Although there is no concrete evidence about the success of CBT, it has gained great momentum over recent years in the USA (Grant *et al.*, 1979; Harris, 1982b, Harris *et al.*, 1985; Bruke, 1989). There are extensive publications and

promotional agencies on CBT, which lead to its wide acceptance and impact (Harris, 1982a,b). Approximately half of the American states have committed themselves to competency-based education. The innovators were Kentucky, Florida and Oklahoma. A very good example of a totally competency-based approach in Canada is the community post-secondary school called Holland College on Prince Edward Island. This school uses a competency-based approach by intensely involving practitioners to analyse the industry based tasks required in their actual role. The task analyses are then used to develop the curriculum. Holland College also conducts continuous development programmes aimed at properly orienting and committing staff and students to the ideas and procedures of a CB-approach (Maginn, 1978).

Over the past couple of decades research has been carried out to indicate the success of CBT. Researchers have found that the CB-approach is equivalent if not superior to traditional approaches (Sewell, 1974; Kentucky Dept. of Education, 1978; Blank, 1980; Camaren, 1983, Harris *et al.* , 1985). These researchers agree the CB-programmes which are well designed and properly implemented enhanced learning, shortened time for training, provided for greater chance of success through individual interactions and developed a more favourable attitude for learning. The enhanced learning can be because CB-programmes provide clear objectives which are made known to students prior to learning. This enables students to know what is expected of them. Moreover, the resources required for each learning stage are provided beforehand and given with free access.

The shortened training time remains disputable depending on the type and structure of the course being conducted. However, if a completely self-paced and time-free system of learning takes place it is likely that some of the trainees will shorten their time for training. This will depend on their effort in learning and on things such as provision of resources and the teaching/learning environment being the same as demanded by CBT. Another point is the amount of experience of a student. A research paper by Heath and Williams (1982) on 224 marketing students in 16 post-secondary classes in the USA suggests that students with more experience could cover more materials or the same materials in greater depth. This means that if the institute has a CB-curriculum, the more experienced trainees could complete the course earlier. This may indicate using an entry level test, to decide which students can start on different units/modules.

The favourable attitude of students towards a CB-programme may be because it operates on the real needs of trainees. The training is better matched to their needs. This, coupled with

clear and definite objectives, makes learning easier than the traditional system which stresses theoretical knowledge. An added advantage is the provision of constant feedback through intensive interaction among the students, and/or between students and teacher in the case of difficulties (Mager and Pipe, 1983). This provides more intensive individual interaction before the attainment of the competence level in each unit and before the student is allowed to move to the next unit. This gives students a greater chance of success.

Research also indicates a favourable attitude towards CB-approach by teachers (Macdonald, 1980; Wickenton, 1981, Harris *et al.*, 1985). The preference of CB-approach over the traditional system is seen in the light of its flexibility, allowance for variation in learning rate and accommodation of literacy difficulties by using teaching aids such as simulation and role play. CB-programmes also improved student/staff relationships because of one-to-one interactions. It also provided definite learning guidelines as compared to the traditional approaches due to its pre-defined objectives.

The capacity for CB-approach to accommodate the needs of slow learners is well depicted by Drummond (1981). CB-programmes allow the students to move at their own pace and provide opportunities to meet teachers on an individual basis. If a student has problems, then the teacher is able to spend more time with the particular student; others with fewer problems proceed to the next unit, thus allowing the teacher to meet individual needs at all levels of ability of a class. This finding is ascertained by Harris *et al.* (1985) who worked with panel-beating students and Fleming (1990) in class evaluation of water- technology students. The students were appreciative of the opportunity to progress at their own pace and to have their work measured against set criteria rather than against other learners.

Swindle (1974) mentions that the possibility of early exit is a strong motivation for some students. Some students showed a preference for CB-programmes after initial frustration. The initial frustration is linked to the need for orientation to a CB-system and its materials and the demands for self responsibility for learning which it puts on the students (Blank 1980; Harris *et al.*, 1985). CB-programmes are time-free, and students are allowed to progress as soon as they attain the set competencies. Those students who finish the competencies listed are allowed to exit the course. This should drive a student to work harder if (s)he wishes to finish the course earlier.

There are also indications that CB-programmes have advantages over the traditional approaches in terms of student time consumption, cost to the institution and job procurement

(McClure, 1973). Research in teacher education has shown that CB-programmes result in improvement of the quality of training and positive changes in the delivery system (Adams *et al.*, 1981).

Macdonald (1980) and Wickenton (1981) have found out in their research that there is a need for specification and enforcement of standards. These needs could only be reached after much consultation with firms that will be using the students after graduation. Moreover, it is very difficult to set standards for everything that a student is required to learn. Thus there is a need to have a governing body within the institute for setting the standard and its specification. These two authors have also described the changed role of teachers in CB-programmes (see 2.7). There is evidence for the need for continuing staff development, effective student orientation and continual material revision if a CB-programme is to be efficient and effective.

The above brief research review depicts some of the advantages CB-programmes have over the traditional approaches to training. It must also be noted that there is a lack of conclusive evidence which proves CBT to be the ideal training tool for all situations. However, it seems logical enough to use a CB-approach if a teacher wants to know where students are going, how well they are doing and what (s)he wants them to attain at the end of the curriculum. Moreover, CBT takes into account the individual needs and pace of the trainees, thus giving learners equal opportunity for learning. This is not possible in the case of traditional systems as all the students have to move together or be left behind without much remedial instruction and possibly having to repeat the whole course. The most important feature of CBT is the specification of objectives which acts as the landmark for all the learning that takes place.

2.7. Implications of adopting CBT

A number of implications will arise as a result of adopting a CB-programme. One is the need for teaching staff to analyse the skills, attitudes and knowledge essential for the job under study. Such an analysis will require a thorough observation of the job to be performed and interviews with persons, preferably the examplary ones doing the job (Grant, 1979; Maginn, 1978). These people may also need to be included in the development of the curriculum.

CBT also requires making learning programs to suit an individual or company. Hence, the syllabus topics may need to be replaced by a checklist of activities or objectives and schemes of work replaced by profiles and profiling procedures which will help record individuals' progress

(Stanton, 1989). Every activity has a step by step procedure of the salient features which need to be taken into account while performing the particular activity. These procedures are arranged into units or modules with sub-objective(s) so that students and the teacher know which unit follows the other. The progress through the units is marked on the profile sheets of the individual students after they have undertaken the competency test. Such an activity will enable staff, students and a third party to make objective judgements with respect to the student outcomes. Moreover, assessment in CBT is a part of one learning process with as much emphasis on diagnosis as on the grading (certification) of students (Stanton, 1989), unlike conventional assessment which comes after learning has taken place. Self-assessment and student assessment by proctors becomes a salient feature in most CBT. (Grant & Kohli, 1979).

One of the crucial issues with CBT is the role of the teaching staff (Grant, 1979; Macdonald, 1980; Wickenton, 1981; Stanton, 1989). In CBT teachers need to shift their role from mere lecturing to other forms of interaction with students. The teacher is required to play the role of an instructor, motivator and manager (Davies, 1973; Mager & Pipe, 1983; Wilson, 1987a). Instruction is given only when asked or when the resources are not available and/or when a learning problem requiring special assistance is diagnosed. As a motivator the teacher provides students with favourable consequences for desired performance, removing obstacles to learning and modelling desired performance. As the manager, the teacher's role is to provide students with the right materials and resources at the right time, maintaining class records and ensuring that the students' progress is in accordance with the institute's policy.

Finally, CBT stresses outcome accountability. The competency-based movement could degenerate into what Grant (1979) call a "grand hoax" and lead to an illusion that students are more competent. To prevent this illusion, curriculum development has to be on the basis that a totally new programme is being developed instead of designing a new programme around the existing courses. Any courses retained must be justified on the basis of need rather than prior existence (Mather *et al.*, 1978). This means that ideally for CBT it is necessary to undertake a total analysis of the working conditions and tasks. Based on these analyses, a curriculum is built which has a set objective(s) and the required competencies. Thus the final product will be a new curriculum constructed on the basis of the needs of trainees, users and the employers. This curriculum will represent the near reality of the working environment outside the four walls of an institute.

Chapter 3

Methodology

3.1. Data collection technique

Information about a population can be gathered in number of ways. Information gathering techniques range from simple observation to intensive interviewing of the target population and performing experiments by using control and treatment groups. At times combinations of different methods can be used complementarily. The choice of method depends on objectives of the study and the information required to satisfy these objectives. Other factors such as time availability, resources and characteristics of the target population must be considered in selecting the methodology.

For this study, the survey technique was selected as the main method of collecting information. Backstrom and Hursh-Cesar (1981, p8) write that a survey can be conducted by any one of the following interviewing methods:- in person, by telephone and through postal mail. Each one of these methods has its own advantages and disadvantages (Dillman, 1978, p39-78).

The survey technique used for this study was a postal survey. A questionnaire was sent by mail to each respondent. Some of the information was supplemented by reviewing official documents, observation of the VFS and informal interviews and discussions with the District Animal Husbandry Officials (DAHO), farmers and senior Animal Husbandry officials. The latter methods were essential to complement the information provided by the postal survey on the competencies required for the field staff.

3.1.1. Reasons for the choice of survey technique

1. The veterinary field staff (VFS) from the cadre of veterinary inspectors (VI) and below were to be the population sampled. The required competencies differed greatly depending on the type of farm, project areas and regions within the country. Conducting an extensive rather than an intensive survey was required if the information being gathered was to be useful. The postal survey seemed the only means of reaching a target population widely separated and with poor communication, as happens in Bhutan.

2. Time was the major constraint, as the information had to be gathered within the two months of my study leave in the country. The postal survey provided the best means of collecting the data from the field staff in the shortest time possible.

3. Many parts of the country are not yet linked by motorable roads. Those linked have very little public transport and it could be days before one can get a ride. Moreover, the roads are prone to slides in the rainy seasons due to the geo-topography of the country. If landslides happen, the roads may remain closed for a few days or even months. This would have made it impossible to reach a sufficient number of people in two months.

4. Cost was another factor which prevented the use of telephone and personal interviews. The cost involved in the personal interview would have been more because of the non-availability of a proper transport system and the time involved. The use of a telephone for interviewing is also costly. Besides, many of the districts are not linked by the telephone system. Those linked have improper transmission which often makes it hard to communicate. The mail questionnaire was the most suitable and the cheapest means of collecting the information required while keeping within the budget allocated.

5. Because the survey offered potential benefit to the VFS through improved training, a good response rate could be expected (Dillman, 1978; Baumgarter, 1978).

6. Because the information gathered was the first of its kind in Bhutan, it was important to involve as many respondents as possible. A mail questionnaire seemed the only method which would cover all the field staff. It was also the most economical and efficient way available to collect information.

Mail surveys can be less reliable and of little worth because of low level of response and low quality of data obtained compared to the face-to-face interview (Dillman, 1978). Improvements in the constructions of questionnaires have enhanced their capabilities to produce high response rate and quality results. This has made mail surveys more competitive with face-to-face interviews, in terms of both the quality and quantity of the data obtained. Greatz (1985) confirms that data obtained from the mail survey can compare favourably with other interview methods.

3.2. Selection of respondents

All the veterinary field staff, i.e. veterinary inspectors (VI) and those below this cadre, were selected for the mail survey. The reason for selecting all the field staff was the wide geographical distribution and small number of 250. The RVI is the only training institute for VFS. It therefore has to cover training suitable to meet the needs of the differing farmers, geographical conditions and animal species for all Bhutan.

The RVI had phased out the provision of 1 year certificate course since 1986. This meant that the VI would be the lowest cadre in the hierarchical structure of the DAH, and in the future the VIs would need to carry out the work of the VCs and the VFAs. Hence, it was essential to include all the VFS if job competencies of all the cadres were to be obtained.

However, this endeavour to obtain information from all the field staff was hampered due to the unforseen unrest in the southern part of the country which erupted in the later half of 1990. This unrest resulted in the closure of postal services and other means of communication. As a result only the Central, Western and Eastern parts of the country were surveyed.

3.3. Questionnaire

3.3.1. Design

The questionnaire was designed to find out the competencies of the field staff (see chapter 1). The questionnaire was constructed with the following main questions:

1. What background the respondents have
2. Type of training they have undergone
3. what subject areas (knowledge and skills) they need to use in the field
4. How they judge their ability to perform disease diagnoses
5. What type of supervisory work they perform
6. How they viewed their ability to perform supervision
7. What level of communication skills they possessed
8. How they view their training in the RVI
9. What changes they expected in their work in future

A draft of the questionnaire was produced with some closed questions with ordered choices for response in the boxes. Other questions were open-ended.

3.3.2. Pre-testing:

The questionnaires were pre-tested on three Bhutanese students from the DAH attending Lincoln University. This was as close to the target population as I could get because the questionnaires were prepared at Lincoln University. They were requested to fill in the questionnaire and return them with suggestion on the structure, ambiguity of words used and the time required to fill the questionnaire. The feedback provided by the pre-test was as follows:

1. To use words which are easy to understand by the field staff.
2. Spreading out of the ordered choices so as to make the reading easier.
3. Use of more yes/no questions
4. Use of some direct questions such as "I need ....."

The questionnaire as a whole was satisfactory except for the points stated above. The time required to complete it was approximately 15 minutes. As a result of the pre-test more yes/no questions were included. Some structural modifications were carried out to make the questionnaire more decipherable and presentable. The final version of the questionnaire is presented in appendix II. It consisted of 24 questions in 10 pages. No coding was undertaken at this stage in order to keep the questionnaire looking less complicated. This would make the analysis harder but was justified in the interests of simplicity and promoting a higher response rate.

3.3.3. Distribution:

The distribution of the questionnaire was undertaken in two forms:

1. hand delivery to some DAHOs for distributions to their field staff. This enabled reaching the field staff who were not linked by proper mail services.
2. postal delivery to those districts where hand delivery was not possible.

In both cases envelopes with return address and postal stamps were provided. Respondents were requested to return the filled questionnaire within one month after they received the questionnaire.

A follow-up reminder was sent to the respondents after 3 weeks as the return rate was low. This did not produce much response. A second reminder was sent, in the 4th week of September 1990, this time through their controlling officials. The final date for return was fixed as 31st October 1990 because it was the last date for the field work. However, as I was not analysing the data immediately an additional reminder was sent on the 3rd and 4th week of October to those who had yet not returned the questionnaire asking for them to be sent to Lincoln. No response was obtained from this request.

3.4. Interview and document research

The study was the first of its kind in Bhutan. This made it necessary to collect as much information as possible. The questionnaire covered only some aspects of the competence level of the field staff. To obtain a high response rate to the questionnaire, too much information could not be included for fear of making the questionnaire lengthy (Dillman, 1978 p19-33). To elicit more information on the competencies required for VFS to perform their job, informal interviews and discussions with some senior officials were carried out (see section 3.1.). Information was also gained by searching records held by the DAH and my own personal experiences.

3.5. Analysis of the Survey Data

The data obtained from the survey were analysed using the SAS programme on the VAX-terminal at Lincoln University. Before using the programme the returned questionnaires were edited and coded by assigning a number to the variables (see Appendix III). The data was entered into the SAS file in free form format till the complete data were entered. Then the SAS file was set with names of the variables (Whittle, 1987).

Once the file was set with the variables' name SAS commands were used to sort out these variables. These commands formed the variables into a set of variables and provided the percentages and frequency of the variables under study. Since the analysis was to be a simple descriptive one, no statistical analysis was attempted.

The descriptive analyses are presented in the form of graphs, viz: pie-graphs and bar-graphs using Harvard Graphics. Some of the responses are presented in the form of tables which provide the frequencies of responses and percentages of them. Wherever weighted values are provided the weightage was obtained by multiplying the weightage by the frequency of response. The product is added to provide the sum of products. The rank score mean values were achieved by multiplying the rank by frequencies of response and dividing the sum by number of respondents.

Chapter 4
Result of the Survey

4.1. Background information

4.1.1. Response rate

The questionnaires were distributed on the second week of August 1990. By the end of August 1990, only about 25% of 150 questionnaires distributed were returned. A reminder was sent to those who had failed to respond after a month. By mid-September about 40% response was obtained. Another reminder was sent, this time through the DAHOs concerned. This provided an increased response rate of 15%, bringing the final response rate to 54%. The third reminder asking for return of the filled questionnaires to Lincoln did not receive any response. So the final analysis was carried out from 54% of the population sampled (i.e. 81 from 150 questionnaires sent out).

4.1.2. Demographic characteristics

The Veterinary Field Staff (VFS) consisted of three designated cadres, viz. Veterinary Field Assistant (VFA), Veterinary Compounder (VC) and Veterinary Inspector (VI). VFA occupies the lowest cadre in the structure of the VFS. The final response was made up of 60% VIs, 19% VCs and 21% VFAs (see Fig.4.1). Of these VFS, 74% have been in their present post for less than 5 years and 26% for more than 5 years (see Fig. 4.2.).

Table 4.1. illustrates the respondents' years of service. It shows that the majority of the VFS (70%) have been in the service for less than 10 years. Only 20% have served for 11-15 years, 9% for 16-20 years and 1% for more than 21 years.

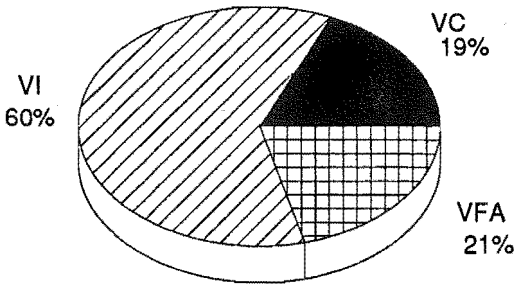


Fig.4.1. Distribution of VFS according to their cadre

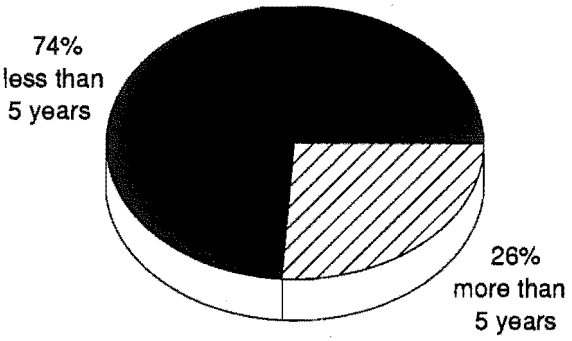
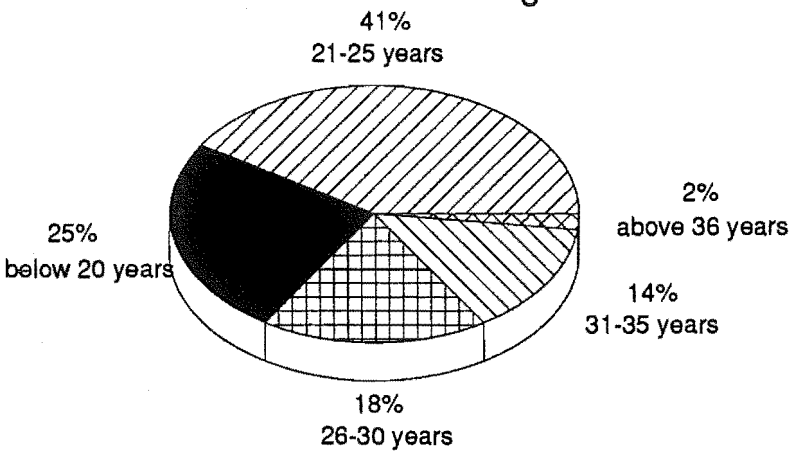


Fig.4.2. Number of years in present post



4.3. Age distribution of VFS

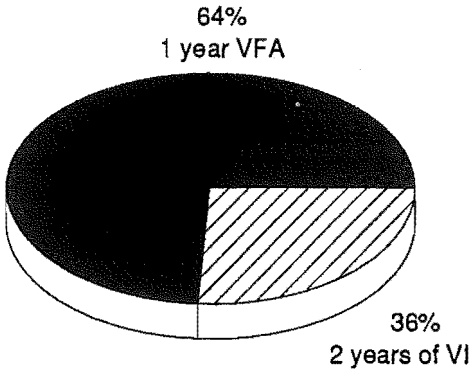


Fig.4.4. Duration of course and qualification of VFS

The majority of the VFS were young (see Fig. 4.3.); 25% were below 20 years; 41% were 21-25 years; 18% were 26-30 years; 14% were 31-35 years and only 2% were above 36 years.

During the survey all the VFS were male, but measures are being taken to encourage female candidates to enrol in the RVI. At the end of the 1990 two women candidates were registered in the RVI. The need for more women in the field is evident as women take active participation in the farming communities of Bhutan.

Table 4.1. Number of years in service of the VFS.

Years in service	No. of response	% response
less than 5 yrs.	28	34
6-10 years	29	36
11-15 years	16	20
16-20 years	07	09
above 21 years	01	<01
TOTAL	N = 81	100

4.1.3. Training

Almost all the VFS had done their initial training in the country. The majority (64%) had one year of VFA training. Only 36% of the VFS had the two-year diploma in Veterinary Science and Animal Husbandry (Dip. VSc. & A.H.) (see Fig. 4.4.).

In addition to the formal in-country and in-service training the VFS are trained abroad. To date, 41% of them were trained abroad in various fields of DAH activities. Countries in which these VFS were trained are shown in Fig.4.5. The majority (85%) have had a short training of 6 months or less. 15 % had their course for 6 months to 1 year (see Fig. 4.6). The type of training courses undergone by these candidates varied from animal husbandry to general certificate courses. Figure 4.7. exhibits the percentage of respondents and the courses undertaken.

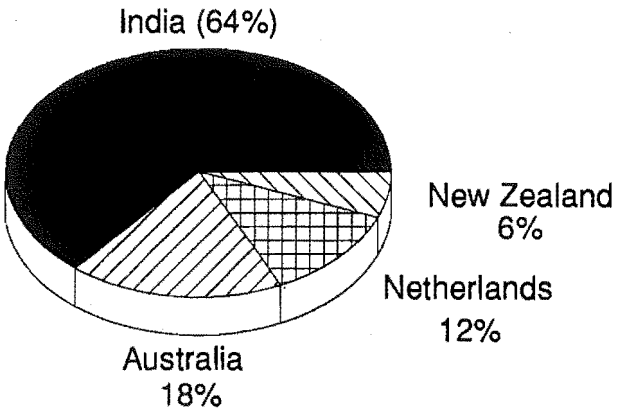


Fig. 4.5. Country of training

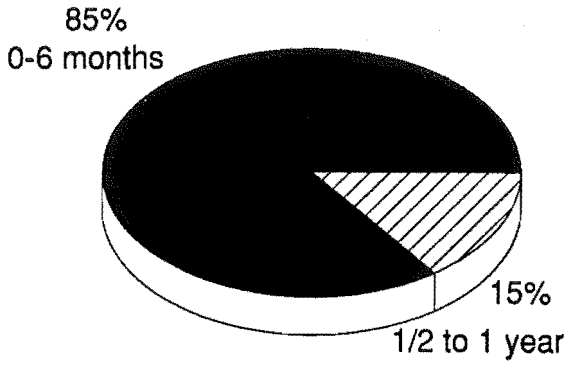
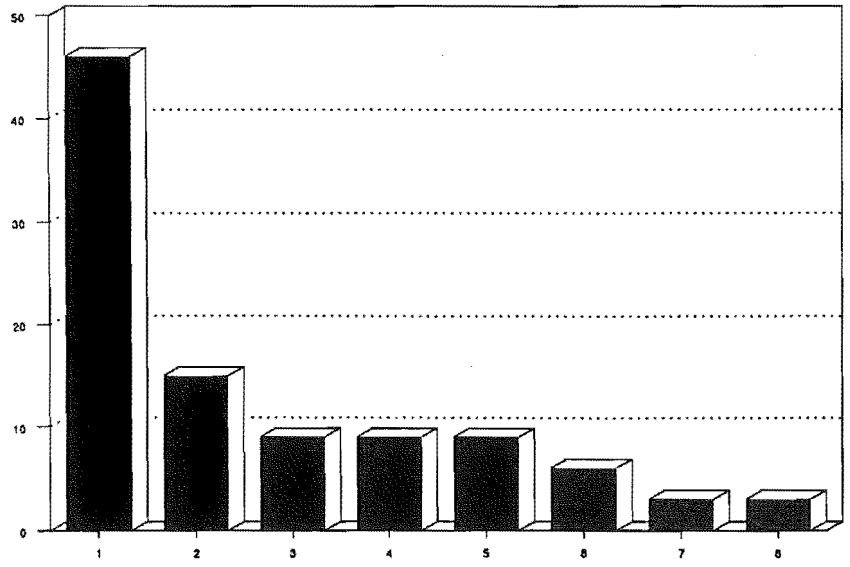


Fig.4.6. Duration of training



1. A.I. and production
2. meat inspection
3. dairy husbandry
4. poultry husbandry
5. sheep husbandry
6. certificate course in veterinary science
7. horse husbandry
8. mechanical

Fig. 4.7. Courses undertaken abroad

Table 4.2. portrays the VFS feelings about their posting. About 40%of the VFS felt they were very happy or extremely happy about their posting. Only 24% expressed that they were not happy or extremely unhappy and 36% of them were neutral.

Table 4.2. The respondents' feelings about their posting.

Rating scale	No. of respondents	% response
Extremely unhappy	8	10
Not happy	11	14
Neutral	28	36
Very happy	28	36
Extremely happy	3	4
TOTAL	N = 78*	100

* 3 respondents did not express their opinion

The reasons for being not happy or extremely unhappy were:

1) the lack of colleagues to discuss or visit by consultants (n=18);
2) lack of transportation (n=10);
3) unavailability of information or senior staff nearby (n=8)
4) improper schooling facilities for their children (n=5).

The co-operation of and easy access to their supervisors seemed to contribute to making the VFS happy. The salient feature highlighted by the respondents on the happy scale was being able to perform work in their training-related areas especially their training abroad. For example a VFS trained in dairy husbandry felt happy if he was posted in a dairy farm.

4.2. Technical information

4.2.1. Skills used in their daily activities

Activities of the VFS were very diverse, ranging from data collection in the field to the surgery tables. From the responses obtained, it seemed that the VFS have to possess skills and

knowledge as large as the field of Veterinary Science in Bhutan. The following responses represented the main activities or skills and knowledge utilised:

1. Extension activities concerning the bringing about of awareness of innovations and demonstrations of management and husbandry practices of livestock. The activities included nutritional aspects such as hay, straw treatment and silage making (n=80).
2. Surgical cases such as castration, vasectomy, suturing of wound, removal of abscess and tumours and hysterectomy (n=77).
3. Preventive and curative treatment of livestock diseases (n=75).
4. Pasture management (n=60).
5. Breeding of livestock (mainly cross-breeding), management and feeding schedules for back-yard livestock farming (n=10).
6. Conducting researches on prevalent diseases, production and other livestock development activities (n=10).
7. Meat inspection and zoonotic diseases (n=4). This is interesting when the second highest amount of overseas training was in this area.

4.2.2. Course subjects requiring more emphasis in the RVI

Table 4.3. ranks the subjects needing emphasis in RVI teaching activities. It is obvious that nearly all the respondents saw that extension (92%) and medicine (90%) required more emphasis than the other subjects. Subjects dealing with definitive diagnosis such as bacteriology (58%), meat hygiene (57%) and virology (51%) seemed to require lesser emphasis. The interesting finding is that the subjects Anatomy and Physiology required more emphasis. This shows that the subjects dealing with knowledge and skills which support field treatment and surgical operations were important too.

Subjects not listed in the questionnaire but mentioned independently by respondents as needing emphasis were:

1. Public health 65%
2. Animal husbandry 60%.
3. Pasture development 30%

Table 4.3. Subjects requiring emphasis in the Royal Veterinary Institute.

Subjects	no.response	% response
Extension	74	92
Medicine	72	90
Anatomy	61	76
Nutrition	58	72
Physiology	57	71
Surgery	56	70
Parasitology	56	70
Reproduction	52	65
Bacteriology	47	58
Meat Hygiene	46	57
Virology	41	51

4.2.3. Competence in disease diagnosis

This section enquired about the respondents' competence in diagnosing diseases of the various species of animals. However, it needs mentioning that this section only gives an overview of competence deficiency because different species of livestock are available in different regions. It is hoped, nonetheless, that this section will provide a guideline in building the curriculum as there is only one institute catering for wide field needs. To come to a conclusive judgement on the VFS competence in various disease diagnoses, a detailed region-wide study needs to be conducted. Obviously emphasis needs to be given to the commonly available animals such as cattle, pigs and poultry. However, the need for VFS to diagnose and treat all the animals under one's jurisdiction made it necessary to find out the VFS competence in diseases of all the animal species available in Bhutan. In general, VFS felt most competent in diseases of cattle, followed by pigs, dogs, poultry and horses. Many felt they were incompetent in diseases of wildlife and yaks.

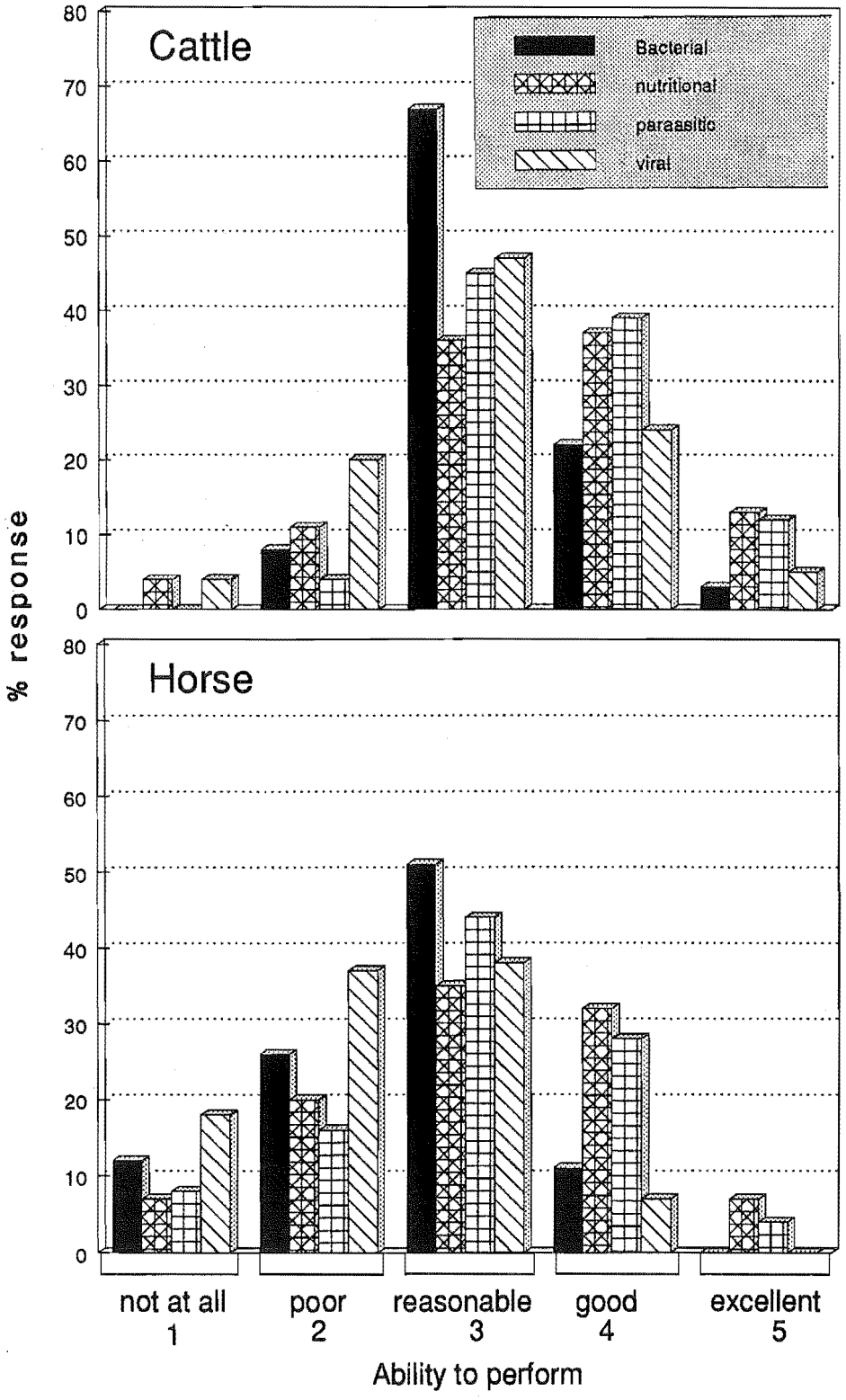


Fig.4.8. Competence in disease diagnosis

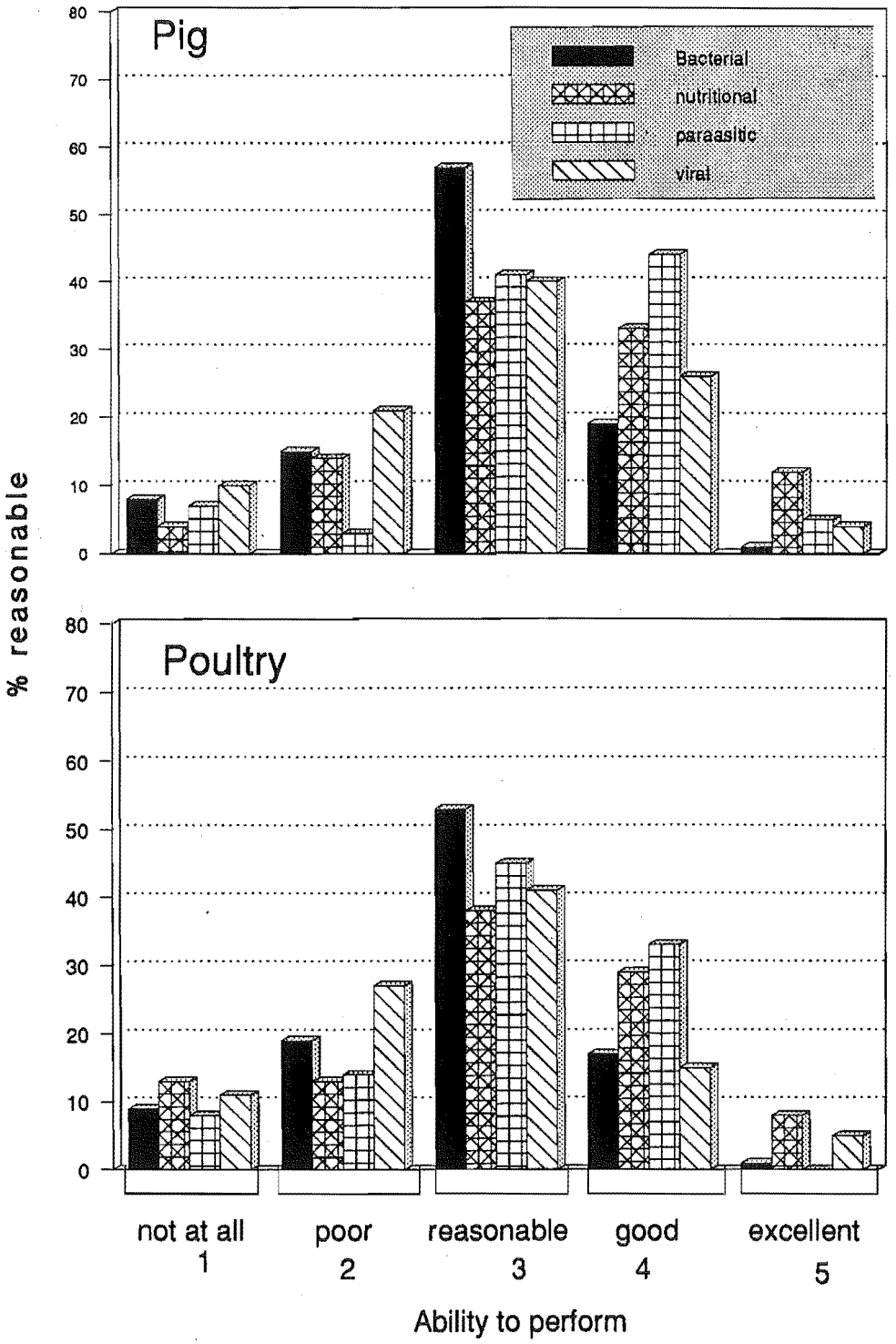


Fig. 4.9. Competence in disease diagnosis

4.2.3.1. Competence in cattle disease diagnosis

Many of the VFS felt competent as far as the cattle diseases were concerned. About 24% said they lacked competence in viral disease diagnosis; 15% in nutritional; 8% in bacterial and 4% in parasitic diseases (see Fig.4.8. Cattle).

4.2.3.2. Competence in horse disease diagnosis

In horse disease diagnosis, 38% and 55% respondents felt they were incompetent in bacterial and viral diseases respectively. Only 27% and 24% of respondents felt the same about nutritional and parasitic disease diagnosis. Thus it could be concluded that a substantial number of the VFS were incompetent in horse disease diagnosis (see Fig.4.8. Horse).

4.2.3.3. Competence in pig disease diagnosis

Most of the respondents could perform pig disease diagnosis quite competently to excellence level. However, 23% felt that they were incompetent in bacterial diseases; 18% nutritional; 10% in parasitic and 31% felt in-competent in viral diseases (see Fig.4.9. Pig).

4.2.3.4. Competence in poultry disease diagnosis

In poultry disease diagnosis 28% respondents felt they were incompetent in bacterial; 26% in nutritional; 22% in parasitic and 38% in viral diseases. This shows that quite a number of the VFS were incompetent in poultry diseases (see Fig.4.9. Poultry).

4.2.3.5. Competence in sheep disease diagnosis

In sheep bacterial and viral disease diagnosis 42% and 44% respectively said they were incompetent. In nutritional and parasitic diseases 32% and 26% respectively felt incompetent (see Fig.4.10. Sheep)

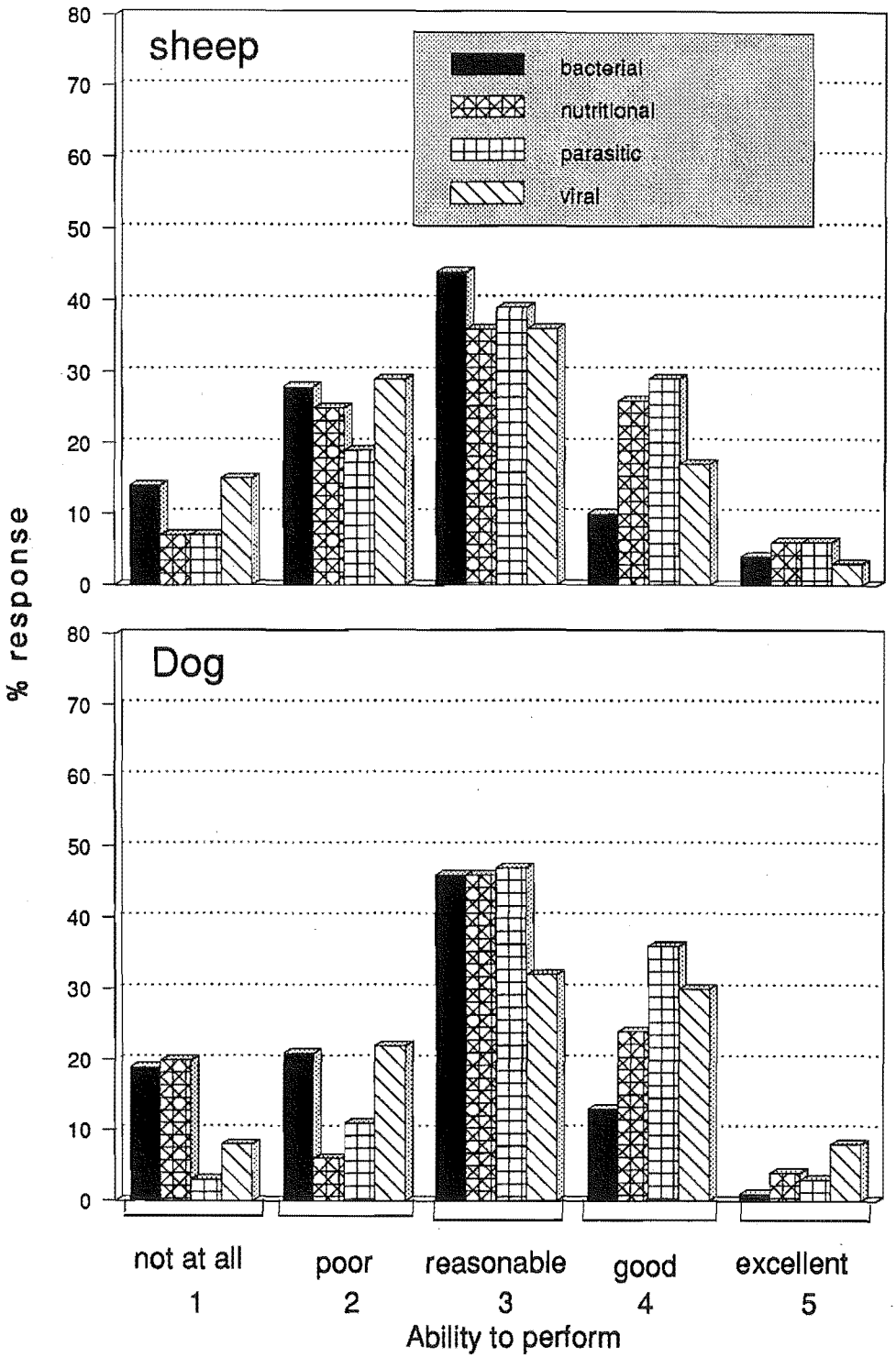


Fig.4.10. Competence in disease diagnosis

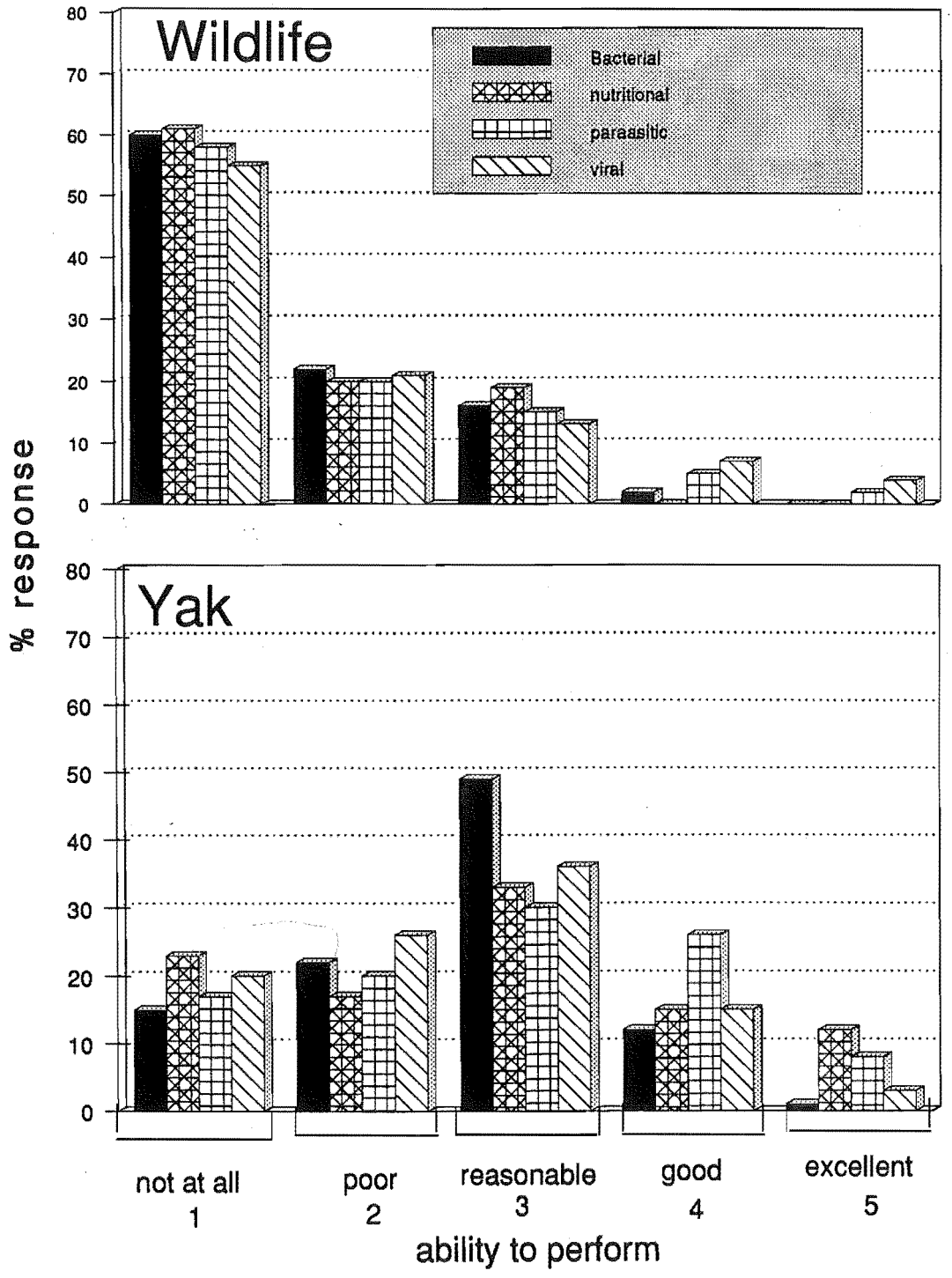


Fig. 4.11. Competence in disease diagnosis

4.2.3.6. Competence in dog disease diagnosis

Only 14% of respondents felt they were incompetent in parasitic disease diagnosis. About 40% said they were incompetent in bacterial diseases; 30% viral and 26% in nutritional diseases (see Fig.4.10. Dog).

4.2.3.7. Competence in wildlife disease diagnosis

Many respondents were incompetent in wildlife disease diagnosis. A majority of 82% bacterial; 81% in nutritional; 78% each felt incompetent in parasitic and viral disease diagnosis. If wildlife treatment is to be carried out by the VFS in future it will require major training (see Fig.4.11. Wildlife)

4.2.3.8. Competence in yak disease diagnosis

About 37% felt incompetent in bacterial; 40% in nutritional; 37% in parasitic and 46% in viral diseases. Thus indicating that a moderately high number of VFS felt incompetent in disease diagnosis of yak (see Fig.4.11. Yak)

This incompetence in the disease diagnosis of various species indicates the need for training in particular species if the VFS are posted in different regions. The type of training required will directly depend on the type of species prevalent in regions to which they are being posted.

4.3. Supervisory activities

The VFS often have to carry out supervision of immediate staff and/or farmers involved in livestock development activities. The supervision may be required during fodder conservation, rearing and management of cross-bred calves and/or establishment of pastureland. Table 4.4. shows the number and percentage of VFS involved in supervisory work.

Table 4.4.: The number and percentage involved in supervisory activities.

	No. Response	% Response
Yes	57	71
No	23	27
Total	N = 81*	100%

* 1 person could not be included in the analysis as no response was provided.

Table 4.4. shows that 71% of the VFS were presently involved in supervisory work. About 27% did not do any supervisory activities. These VFS only performed routine activities such as vaccination, treatment and record-keeping etc. They were also the ones either posted alone or new appointees to the Department. Most of them were posted under Dzongkhags (districts) in gewogs (blocks) where less innovative activities occurred.

Table 4.5. shows the respondents' opinion of their ability to perform various supervisory activities. This table describes the responses obtained from those who answered "yes" to supervisory work. The majority saw themselves as competent in their supervisory work.

Table 4.5. The ability to perform various supervisory activities (N=57).

	not at all		very poor		good		very good		excellent	
	n	%	n	%	n	%	n	%	n	%
organise subordinates' work	1	3	5	9	33	58	12	21	6	11
manage subordinates' time	2	4	3	5	27	47	18	32	7	12
stimulate interest of the subordinates	-	-	3	5	27	47	23	40	4	7
help with technical knowledge	3	5	3	5	18	32	22	39	11	19
detect when things do not work out	6	11	7	12	25	44	14	24	5	9

It is interesting, however, to note that the stimulation of interest ranked highest, with 94% assessing themselves as good to excellent. This, compared with 71% in response to the question "detect when things do not work", indicates some lack of that competence in analysing the problems and obstacles in carrying out activities. About 5-23% of the VFS still see themselves as needing some training in supervisory work in order to be good at their present job.

4.4. Competence in carrying out field activities

The VFS activities consist of five main categories, viz: diagnoses of diseases; treatment of livestock; making decisions relating to the VFS daily activities; advising farmers on husbandry and advising farmers on resources available to them. A five-order ranking was used to determine their confidence in carrying out these activities. Table 4.6. illustrates the confidence of the VFS in performing these activities.

Table 4.6. Confidence in carrying out the field work (N=81).

	not at all		poor		quite confident		confident		highly confident		no answer
	n	%	n	%	n	%	n	%	n	%	%
Carrying out disease diagnosis	-	-	5	6	45	55	21	26	3	4	9
Carrying out treatment in animals	-	-	2	2	36	44	28	35	8	10	9
Making decisions on their work	-	-	-	-	11	14	38	47	25	31	9
Advising farmers on husbandry	-	-	1	1	9	11	41	51	24	30	7
Advising farmer on availability of resources	1	1	4	5	18	22	32	40	16	20	12

The VFS in general felt themselves confident in carrying out the above five main categories of activities. The VFS were less confident in advising farmers on resources available

because only 82% felt confident to highly confident, but more felt confident in diagnosis of diseases (85%) and treatment (89%). The majority (92%) felt confident in making decisions and advising farmers. This suggests that some help in developing confidence in advising farmers on resource availability, disease diagnoses and treatment is required by the VFS.

4.5. Competence in communication skills

VFS constantly have to communicate in one way or the other with their clients, normally farmers, about the new policies and innovative enterprises available to them. They also have to communicate with their superiors and colleagues. This question was asked to find out their their ability to communicate. Table 4.7. exhibits how competent the VFS felt in communication methods commonly used in the field.

Table 4.7.: Percentage of respondents' competence level to each communication category (N=81).

Rank/Category	write to Farmers	speak to a Group	speak face to face with an individual	write in the Kuensel	use visual aids
No Competence	10	--	2	31	15
little Competence	23	11	10	38	35
Competent	51	50	36	22	32
High Competence	11	36	48	2	12
No Response	5	2	1	6	6

The VFS in general viewed themselves as competent in speaking to a group and to an individual. Many felt incompetent in writing, especially in writing an article in the Kuensel (weekly newspaper). About 50% of the VFS also felt incompetent in the effective use of visual aids. It could be concluded that the VFS needs some training in communication procedures, especially in written communication and in the effective use of visual aids.

4.6. Attitude/necessity of induction/orientation course

Only 87% of the respondents answered this question. Of this 87%, 33% felt that there was no need for undergoing an induction course. 67% said an induction/orientation course could be beneficial. Table 4.8. illustrates the respondents' opinions about induction/orientation course needs.

Table 4.8. Opinions about the need for an induction/orientation course (N=76).

	Yes	No	Total
no. response	51	25	76
% response	67	33	100

The question that followed asked about the type of induction/ orientation course a freshly graduated VFS would need before being posted. The following needs were suggested:

1. briefing on the jobs to be performed in the field (n=45)
2. visit to some government farms to study the management giving greater emphasis to administrative and record-keeping procedures (n=35)
3. basic accounting and record-keeping in field conditions (n=25)
4. a knowledge of the administrative system of the department and its linkages with the other departments e.g. Agriculture, Forestry, Health etc. (n=20)
5. to orient on veterinary services working system of other countries with emphasis on husbandry and administration (n=20)
6. maintenance of relationships with the farmers, superiors and other departmental staff (n=15)
7. a brief course on official correspondence and the proper style and channel of communication (n=15)
8. overview of the present Government system and the responsibility of the concerned Dzongkhags, Zones and the Departments (n=10).

Many respondents (n=47) felt that the induction/orientation course needs to be conducted within 2-4 weeks before the final posting, and the duration of the course to be no longer than 3-4 weeks.

4.7. Contact with the RVI staff

This question enquired about the VFS's contact with the RVI teaching and laboratory staff since their field posting. About 42% of them mentioned that they did not seek any help or contact with the RVI staff, while 58% of them had made contact on several occasions. The reasons for not contacting were:

1. lack of proper communication facilities and distance from the RVI made timely contact impossible. (n=40)
2. being newly appointed, they did not face many problems in terms of treatment or diagnosis. (n=30)
3. untimely feedback for their request seemed to discourage them from making further contact after an initial attempt to seek help. (n=25)
4. expertise available in their own Dzongkhags. (n=5)

The reasons for contact with the RVI staff were:

1. for diagnoses of diseases and their further treatment (n=40)
2. to clarify doubts about their field activities (n=35)
3. to inform the diagnostic laboratory of the outbreak of diseases and to obtain man-power support for disease control programmes (n=20)
4. request for field guide-book and to up-date their skills and knowledge (n=15).

When asked if they thought their contact with the RVI would improve their ability to perform better in the field, 97% said "yes". Only 3% thought it would not. The reasons were not given as to why they thought it would not.

The reasons provided as to why they thought contact with the RVI staff would improve their ability were:

1. The RVI, being only institute of its kind in the country, was seen as the sole source in keeping them up-to-date with knowledge and skill through in-service training. This in turn would help them to meet the changing socio-economic structure of the Bhutanese people (n=79).
2. The availability of experts and qualified veterinarians meant that it was the only place for sharing ideas (n=71).

3. The facilities for disease diagnoses being located in RVI made it inevitable to contact the RVI staff for in-depth field investigations and to procure man-power during the outbreak of diseases (n=60).
4. The contact would help VFS in making proper decisions concerning disease diagnoses and treatment. Also such contact would be a source for future references (n=56).
5. The contact would also help in finding out teaching media resources available for bringing the awareness of innovations to farmers' doorsteps (n=23).

4.8. In-service course

4.8.1. Attendance at in-service course

It is essential to conduct in-service training to keep the VFS in pace with recent techniques and to create awareness of the new drugs that come on to the market. The question was constructed to find out the number of VFS who had already attended in-service course(s). The table below gives the number and percentages of VFS who had done in-service training.

Table 4.9. The VFS who had undergone in-service training (N=81).

	no. response (N=80)*	% response
Yes	34	42
No	46	58

* one did not respond

Although it is mandatory, only 42% of the respondents had undergone in-service training and 58% have not yet been reached. This shows that in-service training has either not been conducted regularly, or that RVI have not been able to cope with the increased number of VFS, or that some VFS do not get the opportunity due to a flaw in selection.

4.8.2. Attitudes towards their latest in-service training

Those who answered positively to the section 4.8.1 were requested to rank some characteristics to find out how they felt about their latest in-service courses. The table below shows the attitude of the VFS to their latest in-service course.

Table 4.10. The attitude of the VFS to their latest in-service course (N=34).

	very poor		poor		reasonable		good		excellent	
	n	%	n	%	n	%	n	%	n	%
course relevance to the field	-	-	-	-	19	56	12	35	3	9
co-operation and support of the teachers	-	-	1	3	7	21	16	47	10	29
in-service timing	1	3	6	18	11	32	13	38	3	9
in-service organization	1	3	2	6	9	27	12	35	10	29
theory and practical link	-	-	3	9	8	23	19	56	4	12
information up-date	1	3	-	-	9	27	19	56	5	15

From the above responses it can be said that the VFS in general have a good attitude towards the in-service training. Certain issues, such as the timing of the in-service, organization of hostels and food and linkage between theory and practical needs further improvements. An improvement in the co-operation and the support of teachers is also suggested.

4.8.3. Problems in learning during in-service training (N=34)

Problems relating to the learning during the in-service can be divided into three categories. They are:

1. Institutional Facilities Oriented (IFO) (79%)
2. Target Group Oriented (TGO) (59%)
3. Teacher and Teaching Oriented (TTO) (48%)

The IFO problems cropped up from:

1. the lack of hostel accommodation and food, which at times the trainees had to manage themselves (n=20). This took up the major portion of their study time. Those who were lucky to be accommodated in the hostel had to face cold living conditions and other regulations of the hostel such as collecting their own fire-wood and purchasing food.
2. the RVI lacked proper transport and communication facilities to transport the trainees (n=8) and enable them to keep in contact with their families (n=10).

The TGO problems emerged from:

1. the use of incomprehensible technical terms by the lecturers (n=10)
2. the lack of co-operation among the students (n=8)
3. the inability to cope with the in-service training programme because of the low educational background of the VFS (n=8).

The TTO problems were seen in the light of:

1. the minimum use of visual aids and field visits, thus confining teaching in RVI to lectures within the institution (n=20).
2. teaching in RVI seem to more theoretically based, as the VFS felt that there were no practical demonstrations or these were only available to a limited extent (n=15).
3. teachers delivered lectures very fast and lacked sufficient lecture notes or hand-outs (n=8).
4. teachers being involved in activities other than teaching (n=8).

4.8.4. Solutions suggested to above problems

Solutions to the IFO problems were:

1. by improving the hostel living conditions and food arrangements (n=25).
2. provision of transport for the in-service trainees (n=8).

To tackle the TGO problem following suggestions were made:

1. prior to the in-service training, a study of student background needs to be undertaken (n=10).
2. based on the ability and educational background of these students, teaching materials need to be produced (n=6)

3. duration of training could be made flexible to meet the need of the slow learners (n=4).

To meet the TTO problems VFS suggested:

1. that greater emphasis needs to be given to practical than theory (n=20).
2. in-service training needs to be more field oriented and theoretical knowledge must bear practical implications (n=20).
3. that the lecturers in RVI need to use audio-visual aids during lectures, and class notes need to be written to VFS level and provided in sufficient number so that they could be used in future (n=17).
4. every course must be accompanied by an introduction to the course and a course outline (n=15).
5. to build in an evaluation and feedback system to all the in-service courses (n=10).
6. the teachers in RVI need to keep pace with the slow learner rather than moving on at their own pace (n=5).

4.8.5. Benefits of in-service training

The benefits of in-service were viewed by the VFS as:

1- Participatory benefit

2- Technical benefit

1. Participatory benefit:

-to keep up-to-date with knowledge and skills (n=25).

-a chance to polish their past knowledge and skills (n=20).

-an opportunity to discuss problems and cases from the field, thus giving a chance to share and exchange ideas among the participants (n=15).

-helped to foster their confidence in communication (n=5).

2. Technical benefit: Technical benefits were directly related to the type of courses provided by in-service. Among the technical benefits gained through in-service were:

-immunization techniques (n=10)

-proper diagnosis and treatment of diseases (n=11)

-artificial insemination and handling of equipment (n=15)

-extension methods and implementation of By-laws (n=10)

-methods of communication and pasture development (n=5)

-control and treatment of parasitic diseases (n=8)

-administration and usage of new drugs and equipment. (n=17)

This shows that in-service is valued greatly by the field staff and is an indispensable tool to keep the VFS to the standard required in the field. However, there is a need for improvement in many areas such as the hostel and library facilities and instructional methodology. It is important to know the target group prior to conducting an in-service training.

4.9. VFS pre-service learning experience in RVI

4.9.1. Curricular activities

Table 4.11. illustrates the VFS's ranking of their experiences in RVI's curricular activities. The majority value their training in the RVI only as reasonable to good.

Table 4.11. Ranking of the curricular activities of RVI (N=71).

	very poor		poor		reasonable		good		excellent		weighted sum score	mean
	n	%	n	%	n	%	n	%	n	%		
subject organization	2	3	3	4	29	41	28	40	9	18	252	3.5
field-trip organization	6	8	15	21	17	24	25	35	8	11	227	3.1
practical appropriateness	4	6	9	13	22	31	31	44	5	7	237	3.3
value of farm visit	1	1	10	14	21	30	27	38	12	17	252	3.5
theory and practical link	5	6	8	11	24	32	28	40	6	9	235	3.3

The subject organization was considered satisfactory. The main highlight of this table is that the field-trip organization was felt to be poor to very poor. This shows that although field-trips are a part of the curriculum they are not organized to give students the maximum benefit. RVI seems

to operate weakly on practical appropriateness; farm visit and linkage between theory and practical were poorly rated too. Thus the RVI needs improvements in its curricular activities.

4.9.2. Opinion of the VFS on the RVI as an institute

The general opinion of VFS on RVI shows many VFS were not happy with classroom, hostel, use of visual aids, library facilities and social activities. They were reasonably happy about the subject depth, range and teaching. The over all opinion of the VFS is that the RVI needs improvement in its facilities to exist as an institute (see table 4.12).

Table 4.12. The Veterinary Field Staff's opinion of RVI (n=71).

	very poor		poor		reasonable		good		excellent		mean
	n	%	n	%	n	%	n	%	n	%	
classroom	17	24	21	30	13	18	19	27	1	1	2.5
subject depth	1	1	10	14	29	41	29	41	2	3	3.2
hostel facilities	28	39	23	32	13	18	6	8	1	1	2.0
library	7	10	22	31	24	34	14	20	4	6	2.8
subject range	2	3	2	3	32	45	27	38	8	11	3.5
social activities	12	17	28	39	19	27	10	14	2	3	2.4
teaching	--	--	6	8	22	31	34	48	9	13	3.6
visual aids	13	18	20	29	22	31	11	15	5	7	2.6

4.10. Important changes necessary for the RVI to undertake in future

The response basically provided three essential changes that the RVI needs to consider in future. They are:

1. Improvement of facilities
2. Improvement in teaching and teachers
3. Improvement in planning (policies)

4.10.1. Improvement of facilities

-hostel (86%)

-library (to ensure it is provided with appropriate books) (65%)

-classrooms (54%)

-recreational activities (47%)

-recreational facility (to foster social activities) needed to be built (47%)

-laboratory facilities (30%).

4.10.2. Improvement in teaching and teachers

Improvements in teaching were viewed in two aspects:

1. Teaching methodology
2. Teaching of knowledge and skills

4.10.2.1. Teaching methodology

Improvements in teaching methodology were:

-Simulations and role play in the class needs to be undertaken to provide a better understanding of the field situation, especially in extension courses (n=22).

-theory teaching should be limited to those areas which foster better understanding of practical aspects (n=20).

-teaching in RVI needs to be focused on the practical implications rather than theoretical aspects (n=19).

-teaching must be accompanied with audio-visual aids where applicable and appropriate; for example, use of films, slides and posters (n=15).

-lecture hand-outs need to be practical oriented and to the point (n=10).

Improvements in teaching of knowledge and skills were:

-Skill teaching in laboratory examination should be taught in greater depth and extent e.g. blood collection and examination, fecal collection and examination, samples for histo-pathological examinations etc. (n=45).

-Skills in extension activities such as fodder conservation (hay making, silage, and straw treatment) should be improved or expanded (n=25).

-Skills in properly communicating with farmers, superior and colleagues should be taught (n=25).

-Skills in diagnosing various diseases (n=20).

-Skills in proper and better ways of treatment of diseases (n=20).

-Skills in Artificial Insemination (n=15).

-Skills in surgical operations (n=15).

Improvement needed in teachers were:

-Skills in properly communicating with farmers, superiors and colleagues (n=25).

-Teaching staff need to have some field experiences prior to taking up teaching in the RVI (n=15).

-Volunteer teaching staff needs atleast to be given some chance to acquaint themselves with the working conditions of the field so as to make them field oriented in their teaching (n=15).

-Teachers need to provide feedback as quickly as possible (n=12).

-Teachers need to encourage all students to discuss in the class (n=11).

4.10.3. Improvement in planning (policy)

-RVI graduates who pass out need to be given equal opportunity and cadrization with those passing out from other institutes, e.g. medical and Teachers Training Institute (n=20).

-A policy to send students on a tour outside the country during their study period (n=15).

-RVI need to keep a certain number of animals for practical use and a model farm should be set up to keep these animals (n=10).

-RVI in the long run needs to be attached to a recognised institute so that it can compete at the international level (n=7).

-RVI need to be a separate entity, not attached to RVDL (n=5).

-RVI must up-date its curriculum every 2-3 years and provide in-service training to those in the field (n=5).

-All training under the DAH must be undertaken by RVI, i.e. fisheries training should be amalgamated with RVI (n=2).

4.11. Additional skills and/or knowledge training required in future with changes in the field work

Additional skills and knowledge required in future can be listed into three groups as below.

1. Technical knowledge and skills
2. Extension knowledge and skills
3. Organizational knowledge

4.11.1. Technical knowledge and skills

-knowledge in proper diagnoses of diseases, and skills in using the equipment needed for them (n=50).

-knowledge and skills in housing, management and husbandry of various livestock (n=47).

-knowledge of new drugs in the market and their properties (n=45).

-skill and knowledge in laboratory diagnostic procedure (n=42).

-knowledge and skills in administration and dosage of the drugs (n=35).

-skill and knowledge of surgical operations (25).

-knowledge and skills in production and reproduction of livestock (n=25).

-skill and knowledge in pasture development (n=24).

-skill in identifying zoonotic diseases and knowledge of their prevalence and control (n=15).

-basic knowledge and skill in wildlife diseases and treatment (n=11).

-knowledge on nutrition and skill in computation of feed (n=10).

-skills in meat inspection and knowledge of diseases with public health hazards (n=5).

4.11.2. Extension knowledge and skill

-skill and knowledge in organising and forming a co-operative society (n=35).

-skill and knowledge of various audio-visual aids that can be used in Bhutanese conditions (n=34).

-skill and knowledge in organising field visits and tours (n=29).

-skill and knowledge in organising demonstrations (n=25).

-skill and knowledge in organising meetings properly (n=23).

-skill and knowledge in teaching farmers (n=18).

-skill and knowledge in identifying the types of farmers (n=16).

-skill and knowledge in communication with farmers, superiors and colleagues (n=16).

-skill and knowledge in resources available for farmers to use (n=14).

-skill in bringing about awareness and innovation to farmers' doorsteps (n=9).

-skill and knowledge in farmer motivation (n=7).

-knowledge of development and its processes (n=7).

4.11.3. Organizational knowledge

-knowledge of various gewogs, Dzongkhags, and Zones (n=19).

-understanding of DOAH activities (n=14).

-knowledge of other Departments and their roles (n=9).

-knowledge of communication channels within the DOAH (n=8).

-knowledge of the overall view of the RGOB's structure (n=7).

The above list shows that the needs of the VFS in future are many. It also shows the dynamic characteristic of the field requirements and the need for RVI to keep its curriculum flexible, so that changes in curriculum can be made easily. Since the RVI is the only institute training the field staff it must satisfy the felt needs, if the VFS are to perform competently. To help those trained earlier to keep up with these demands, various in-service training needs to be conducted after proper needs analysis.

Chapter 5

Survey Result Discussion

5.1. Survey result

No statistical evaluation or correlation of variables have been carried out because of the qualitative nature of the information sought. By using rank order scores and numerical frequency of responses it is believed an adequate interpretation of the information is provided.

The final return rate of the survey was 54%, which was lower than the survey returns obtained in New Zealand. Gumbrell, 1984; and Choephyel, 1990 had obtained a 60-70% return rate while surveying for information need analysis for continuing education of the veterinarians. The low return rate could have been contributed to by the poor postal services in Bhutan and by conducting the survey in the rainy season (August to October). The return rate may have also been affected by the areas of unrest bordering the Southern part of the country. Finally, the unfamiliarity in answering a survey questionnaire among the VFS and fear about the subsequent use of the result may have caused concern, even though anonymity was assured.

Three reminders were sent to encourage the respondents to return the questionnaires. It seems that a reminder through their immediate supervisors, i.e. DAHOs and Farm Managers, was more productive than a reminder directly to the respondents. This could be because the people of Bhutan are culturally brought up to be obedient to their immediate supervisors.

5.2. Demographic characteristics

The Department of Animal Husbandry has 3 cadres of VFS, viz: VI, VC, and VFA. The result shows that 60% were VIs. This is not surprising as the RVI had stopped catering for the VFA course since 1986 (RVI, register book no.12). This, coupled with the promotion of VFAs and VCs, could have increased the number of VIs in the field. The effect of promotion seems important, because as shown in section 4.1.3. a majority of 64% respondents had a 1 year VFA certificate while only 36% had a Dip. VSc. & A.H. This finding was similar to the department's staff distribution record.

It can be concluded that the Royal Government had been promoting the VFS in compliance with the national policy of promoting civil servants every 3-5 years. This is shown by the result that 74% had been in their present post for less than 5 years. The 26% who were in the same post for more than 5 years were due for promotion or had had it withheld from it due to their misconduct or poor performance in the field (DAH, personal file and Wangda, pers. com. 1990).

The age distribution of VFS was within the typical age range of the Department staff in Bhutan. 66% were below 25 years with most (74%) in service for less than 10 years. This is because Bhutan's developmental activities started only in the last 2 or 3 decades and it was only in the late 1970s that the RVI was established. Moreover, with education entry becoming more competitive younger students are passing out for training as they cannot qualify for further education.

Many VFS (40%) were happy about their posting because of the facilities and job provided by the government. However, 24% felt unhappy about their posting. These VFS may need some sort of incentive so that their work performance is maintained. This could be achieved by transferring them at regular intervals or by shifting their workplace to near a road and/or school as is done in the Bumthang district.

5.2.1. Training

At present 60% of the VFS have done a 1 year VFA certificate. Bhutan in her early stages of development provided a one year certificate course to meet the man-power demand to carry out developmental activities. However, to meet the changing needs and demands of the society and through the foresight of the then Director of Animal Husbandry and presently the secretary of Forestry and the Department of Roads, Dasho Dorji Tenzin established a 2 years Dip. VSc. & A.H. course in 1981. Although the intake stipulated 15 candidates per annum, this was seldom realised. Many training institutes like Forestry, Agriculture and Medical were competing for the same pool of qualified entrants. The lack of equally competitive training facilities to the above institutes could have been a contributing factor in the failure to attract trainees to the RVI. This results in a high percentage of VFS with the 1 year certificate rather than the two years Dip.VSc. & A.H. holders remaining in the Department.

Training outside the country has become a trend in Bhutan, with a high 41% of VFS with training abroad. Bhutan, being a developing country, has many aided and national projects which demand qualified personnel in specific subject areas (e.g. rabbit husbandry, dairy, piggery husbandry etc.). Such training cannot be provided within the country because of the lack of a qualified workforce and/or facilities as in the developed world. Hence, it is inevitable to send some of the VFS to be trained and harness the technology suitable for Bhutan's needs. Moreover, ample project funds available helped in sending them abroad to broaden their outlook and inculcate the attitude to work habits of the developed countries. In future as the facilities and technical workforce of Bhutan increase some of the training abroad could be reduced.

5.3. Skills required in VFS daily activities

The main activities of the VFS were prevention and treatment of livestock (44%), surgical cases (22%) and extension work (15%). This may be due to the national policy of prevention and treatment of livestock. In doing this, the VFS carry out mass vaccination and deworming of herds at least twice in a year. They are the only technical personnel available to attend all the clinical cases at the village level. Moreover, Bhutan has an open border with India on all three sides (East, South and West) and has every likelihood of diseases being transmitted across the border because of the migrating livestock patterns in winter and summer. Often there are outbreaks of diseases such as Foot and Mouth Disease (FMD), Black Quater (BQ), and Haemorrhagic Septicaemia (HS) which have to be treated because religion does not allow slaughter of animals.

The next main skill was surgical operation. This could be due to the high incidence of accidents either on the road or grazing in the mountainous areas which make the animals vulnerable to fall. Besides, the national policy to control rabies through dog population control by surgical methods has increased the need for such surgical skills as castration, vasectomy and hysterectomy. These skills are also required for preventing scrub bulls' capacity to reproduce.

The third main skill required was extension. Bhutan's high illiteracy rate increases the role of proper communication in promoting animal husbandry and convincing farmers to take up new ideas. The need for a proper extension system also emerged at the 15th Departmental Conference in Limethang, 1990.

5.4. Subject areas requiring more emphasis

All the suggested subject areas were ranked by more than 50% of the respondents as requiring emphasis. This shows that to perform the job of a para-veterinarian requires all the subjects taken in RVI. From the responses obtained it seemed that extension (92%) needed the greatest emphasis followed by medicine (90%). The need for emphasis on extension is stated in section 5.3. In addition, implementation of projects such as Highland Livestock Development Project and High Altitude Area Development Project in various parts of the country meant changing the farmers' attitudes by bringing about awareness and adoption of new ideas and practices in these areas. This meant that the VFS needed proper extension methods to bring about these changes. The emerging need for proper extension methods compounded with little or no formal extension education may have made them realise the need for greater emphasis in the RVI.

Medicine may have been rated high because of its wide application in the field. The VFS are mainly concerned with treatment and prevention of diseases of livestock in Bhutan (see sec. 5.3. para 2). The most interesting thing was the high ranking of anatomy (76%) and physiology (71%). This reflects the need for knowledge components of the skill competence required in the field. Thus, it shows the need to integrate knowledge and skill components of learning.

Among the subjects which ranked lowest were those concerned with definitive laboratory diagnosis such as bacteriology (58%), meat hygiene (57%) and virology (51%). This may be because little is done to carry out the definitive laboratory diagnosis in the field. Most parts of the country have no laboratory facilities and treatments are mostly based on symptoms in the field. These subjects may, however, need to be taught to help the VFS in their clinical diagnosis in future.

5.5. Disease diagnoses in various species

It is very difficult to obtain a conclusive evidence on the need for disease diagnosis because the species of animals vary from sub-tropical in the South to alpine in the North. The questionnaire response obtained would have been based on the VFS's involvement with species at their place of posting. It was assumed when setting the questionnaire that all the VFS will have carried out disease diagnosis of all the species in Bhutan. Wildlife disease diagnosis is rarely carried out. However, occasional calls from the wildlife sanctuaries are attended by some of the VFS. Therefore, a need to equip the VFS with diagnostic ability in common diseases of wildlife

is apparent because 61%-82% felt they were poor to very poor in bacterial, viral, parasitic and nutritional diseases.

The common species, in term of livestock per household, are cattle, poultry, pig (World Bank, 1989, MPW, 1984). The higher competency in the diagnosis of these species may be because of their daily need to deal with these species. In various disease diagnoses of poultry, 22% to 38% VFS felt incompetent. This relates to the infrequent report of poultry diseases by the farmers, as only one or two chickens are kept by the farmers. Usually, poultry disease diagnosis is not carried out unless it is on a farm where a flock of 200-300 birds is kept, because of economic reasons or when a mass mortality occurs in an area. Pigs are also kept in small numbers of 1-2 by each household, but pork being the delicacy of the Bhutanese people pigs are given extra care by the farmers. It is also a major side income for the farmers. Hence, VFS are often called to treat them, thus providing the VFS with sufficient practice and improvement in their competence. 31% per cent of VFS, however, felt they were poor in pig viral diseases.

In the less common species (found only in isolated areas, alpine or sub-tropical regions) sheep, horse and yak competency was generally low. This is possibly because of the infrequent contact with these species.

From the above it can be deduced that a majority of the VFS are competent in the disease diagnosis of the common species of the animals. In less common species some training is indicated.

The VFS in general are expected to carry out diagnosis and treatment of every species in Bhutan, as there is a standing order to transfer civil servants every 5 years. In this regard it may be suggested that: 1) to help the VFS to settle in their new posting place a short course on diseases prevalent in the new posting area be provided; 2) if 1 is not feasible for any reasons then posting needs to be carried out within the same region. The advantage to be gained from posting in the same region is the increased knowledge and awareness of regional specific needs with the likelihood of a work career remaining within that region.

5.6. Supervisory activities

Many VFS (89-94%) who performed supervision felt competent in various aspects of the supervisory role. Among the different categories of supervisory roles, their strongest point was

the ability to stimulate interest in the subordinates. The weakest point was in detecting the cause of problems. This inability may be because Bhutanese in general are poor in analysing problems, and they are often easily satisfied with the overall achievement of the work and do not normally bother about the minute details of the work. The ability to stimulate interest may be because of the complacent nature of the subordinates and their obedience, which the supervisors see as their ability in stimulating interest. I have often observed personally that farmers work harder in presence of a supervisor than in his/her absence. There were, however, a few (5%-23%) VFS who felt they were incapable in various aspects and training may be suggested after a thorough further investigation.

5.7. Confidence in carrying out the field activities

The VFS's activities consisted of disease diagnosis, treatment of livestock, making decisions on their daily activities and advising farmers. 85% VFS felt confident in carrying out disease diagnosis. This conflicts with the answers provided by DAHOs, who said that VFS were not very confident. My personal observation is that they are confident with certain diseases like FMD, BQ and HS. It is very doubtful if this will mean confidence in disease diagnosis in totality, because often diseases are not diagnosed but treated on the basis of symptoms and history.

The high confidence level of VFS (95%) to treat diseases may be due to the result of giving symptomatic treatment which relieves the animals. Moreover, many of the cases treated do not return to the dispensary for reasons unknown to the VFS. These cases are often accounted as cured. In addition there are only a few drugs available in many dispensaries and in time the VFS gets well acquainted with their use. Hence a high percentage of VFS may have ranked themselves as being confident in treatment.

Most VFS (92%) felt confident in advising farmers on husbandry practices. This high level of confidence may be due to the high illiteracy rate among the farmers and VFS being technically trained in this field. Often, Bhutanese farmers take advice without question because farmers think of the VFS as a "know-all person". There may not be anyone more educated than the VFS in a village. Thus, the quality of advice provided has to be explored and future training on advising the farmers needs to be based on further investigation.

Only 82% felt they were confident in advising on the resources available. This shows that 18% either did not bother finding out about the available resources or their supervisors have failed to relay it to them. This also suggests a lack of aptitude of the VFS to explore and find out.

In this question there were 7-12% no response in various categories. The probable reasons may be: 1)- they were not able to judge their own ability. 2)- they did not want to show their ignorance because Bhutanese are culturally shy and do not normally express their feeling. 3)- they may have been afraid that it might affect their job. The overall view of the response is that the VFS were confident in carrying out their daily activities.

5.8. Competence in communication

VFS frequently need to communicate with farmers and supervisors. Table 4.7. reflects that the VFS are competent in group (86%) and individual (84%) communication methods. This was as expected, because villagers are frequently asked to gather for meetings or discussions by the VFS. They also pay house-calls to treat animals and/or demonstrate straw treatment or hay making. Hence they may have developed good communication skills in individual and group methods. These methods, however, cannot cover all areas and in future there will be a need to use other means such as written and audio-visual aids. From the response only about 50% and 69% VFS were competent in using visual aids and written communications respectively. These two communications are vitally important for a country like Bhutan because of the sparse and wide geographical distribution of the population. Thus it can be assumed from the responses that training in writing Kuensel articles and effective use of audio-visual aids needs to be provided.

5.9. Induction/Orientation course

Sixty-seven percent of the VFS favoured having an induction/orientation course, although no such course has been conducted so far. In the past, they were posted directly after graduating from the RVI. This caused problems in performing administrative work initially. So, to help the VFS to settle in their jobs after passing out, it is suggested that an induction/ orientation course needs to be provided before their final posting. The course could be constructed based on the needs identified in section 4.6.

5.10. Contact with RVI staff

The high response (97%) suggests necessity to establish contact between the RVI staff and the VFS. This contact will have a symbiotic effect between RVI staff and the VFS. The VFS would benefit from the advice and suggestions from the RVI staff, and the latter would be able to gather relevant information for their lectures. These contacts would also help the VFS in continuing education and updating information up.

5.11. In-service training

A high 58% of VFS not having undergone in-service training reflects that the RVI has not been able to cope with increased number of VFS or has not been conducting in-service training regularly. In-service training is of vital importance to Bhutan as there are no library facilities within the reach of the VFS in the country. The biannual journal of the department, the only one of its kind, does not reach many of the VFS. Thus, maintaining the knowledge and skill of the VFS at a competent level will depend on the number of in-service courses each individual undergoes. The need for regular in-service courses was expressed by the DAHOs during their interviews too. Hence it is suggested that in-service training for refreshing and upgrading the technical ability of the VFS needs to be conducted at regular intervals. In this regard, atleast one in-service training a year needs to be conducted for all the VFS who have served for at least three years.

5.11.1. Issues to be addressed during in-service training

The overall attitude of VFS towards in-service training was good. There were some issues of concern which the future organisers and conductors need to consider. Over the years in-service training has been conducted ad hoc and on the basis of fund availability. In future, all training should be supported with a needs analysis from the field. Another thing to consider is the timing of in-service training as, 21% felt it was poor to very poor. It needs to be conducted only during the periods which do not conflict with the VFS field activities. There is also a need to address accommodation and organization of in-service training as, 9% felt it was poor to very poor. This could be solved if the budget allows provision of accommodation in the institute's hostel.

Prior to conducting in-service training, the target group's characteristics need to be known. This could be achieved through their service and educational records. Knowing the target group enrolling for the in-service training would help in providing training suitable for the target group's capacity.

During teaching, a teacher needs to use relevant (teaching) materials and concentrate more on the skill requirements (practical). Knowledge should only be taught where it helps in performing the skill. Many respondents (20%) felt that in-service training in RVI lacked practical demonstration.

5.12. VFS learning experiences during their pre-service training

The VFS's learning experiences in the RVI were only rated as reasonable by most of the VFS, as the mean ranking score ranged from 3.1 to 3.5. (see Fig. 5.1.). This mean score lies between reasonable to good on the scale, showing that RVI curricular activities were not organised properly to provide for the learners to get the maximum benefit. This is not surprising as the budget is very low compared to the other developmental activities of the department, so practicals cannot be carried out as designed. There is only NU 5000/- (NZ $500) allocated for the field-trip per year for three classes. This amount is just sufficient for one field-trip of one month's duration. The difficulty of field work is aggravated by the extreme range of conditions in Bhutan - sub-tropical in the south to alpine in the north. This causes time-consuming travel and makes it virtually impossible to provide a full range of in-country field experiences for trainees. Thus the organization of a field trip is very difficult. Often, the students have to be sent on their own because there is an acute shortage of teachers. There are only 16 veterinarians in the country, and many of them are involved in other developmental activities. There is only one national veterinarian teacher at the RVI and he may not be able to accompany the touring group because of the other two classes in session. United Nations Volunteers (UNV) could be sent within the country but if field-trips involve crossing the Indian border then a special permit has to be obtained which is difficult. In future however, it is hoped that the conditions will improve through the amalgamation of the institute to the National Resources Training Institute.

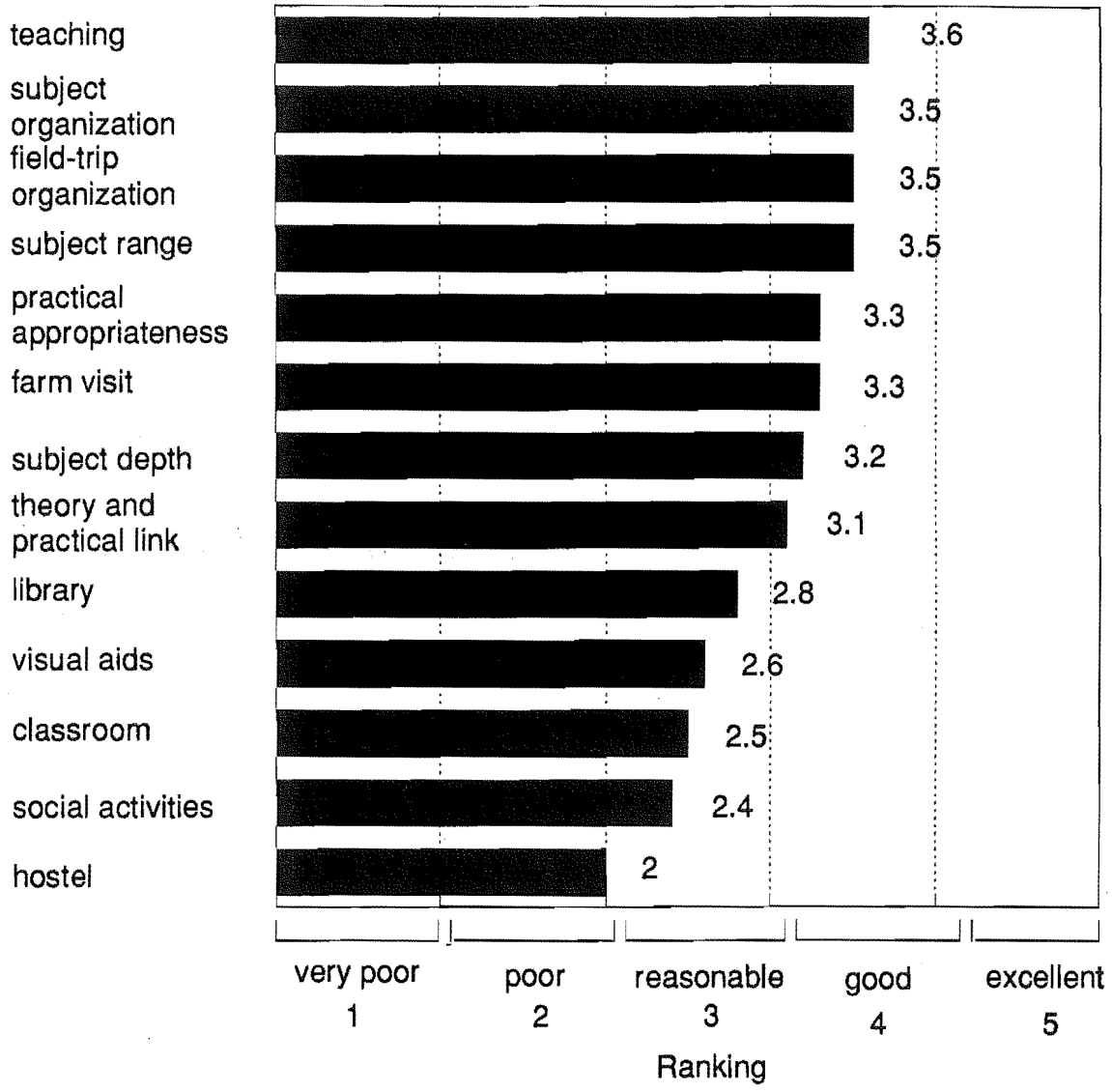


Fig. 5.1. Opinion of VFS on RVI (mean score ranking)

5.13. Opinion of the VFS on the RVI as an institute

The opinion of the VFS on the RVI was poor to reasonable, as the mean score rank was between 2.0 to 3.6 (see table 4.12). This reflects that the RVI was not seen by many as a congenial place for training especially in terms of hostel (2.0), social activities (2.4), classroom (2.5), use of visual aids (2.6) and library (2.8) (see Fig. 5.1). Any training needs to be carried out in a positive and helpful learning climate (The Department of Industrial Relations, 1989). The mean score ranking of the VFS on the RVI shows that it has not been able to provide a conducive learning environment for the trainees. This is not surprising as Bhutan is a developing country with a low per capita annual income of US $160 (Asia Week, 1990, World Bank, 1989). There is a need to support and improve the basic necessities of the people (e.g. drinking water and medical care). Hence the budget allocated to teaching is comparatively small, which makes it difficult for the administrators to maintain the institute. The institute, being attached to the RVDL, is also affected by any changes in the functioning of the RVDL. This coupled with payment of stipend to all the trainees means a substantial amount is spent on training without income from the institute. If the institute is to provide good facilities, two things need to be carried out:

1)- some sort of user-pay system should be instituted in future based on the per capita income of the parents, and/or stipend should be channelled solely for provision of accommodation (food and bedding) with a small amount of pocket money.

2)- the institute could exist as a separate entity in its administrative and functional role (Tate, 1988b).

5.14. Changes the RVI needs to make

There are three salient changes which the RVI needs to undertake. They are grouped and presented in section 4.10. It is suggested here that improvement in facilities needs to be made. This would provide a conducive learning environment which is essential if the students of RVI are to perform at their peak. The improvement in terms of facilities can be achieved by better utilization of students' stipend and a user-pays system as suggested in the previous section.

Teaching and teachers can be improved by teaching the essential job requirement of the field. This could be obtained from the needs analysis of the job and provision of more practical-oriented classes. Keeping in contact with the VFS would also help in the provision of appropriate field requirements. An improvement in teachers' attitudes towards their students can be achieved

by training in student motivation, systematic instructional delivery and improvising a proper feedback system.

Improvement in planning (policy) can be attained by keeping the curriculum flexible so that any needs can be accommodated. Furthermore, to encourage and attract new trainees to the institute the passed-out trainees need to be placed in the same cadre as their Medical and Forestry counterparts. This problem will hopefully be solved after the establishment of NRTI, as there will be a pooling of students from three institutes and the entry level and passing-out qualification will be the same. A plan to send trainees at least once during their training period in the RVI on a tour to some established farms outside Bhutan may be instituted. This would help to broaden their outlook in various aspects of animal husbandry and management.

5.15. Additional skill and knowledge requirement in the future

Basically, three kinds of additional skill and knowledge requirements were identified by the VFS. They are given in section 4.11. The additional skill and knowledge requirements reflect the need for proper diagnosis and treatment, management and housing, and laboratory diagnosis. In extension organization of various co-operatives, field-visits and demonstrations are becoming increasingly important. This necessitates that the RVI in the future emphasize these areas. It also shows the changing needs and demands on the VFS for precision and accuracy, especially for diagnosis and treatment. The commonly practiced symptomatic treatment will no longer be accepted. The VFS need to equip themselves with knowledge and skills to meet the changing demographic characteristics of the Bhutanese farmers. This also indicates the need for the RVI to keep its curriculum flexible to accommodate the changing needs and provide training relevant to the field needs.

The RVI, being the only one of its kind, will need to meet these changing demands. This can only be achieved by providing a systematic curriculum design based on a needs analysis of the competence required in the field and regular revision of the curriculum. To know whether the students of RVI are going into the field with the right competence requires a regular assessment system to be built into the curriculum. CBT as proposed in this thesis will provide for such a system.

Chapter 6

Course Curriculum Development

6.1. Competencies required by Veterinary Field Staff

Identification of the competencies required was achieved through personal interviews, survey results (see chapter 4), record research and field observations. The field observations were done mostly around the Thimphu area. The personal interviews involved 6 DAHOs and 10 farmers. The personal contact with the farmers did not produce substantial results. This may be due to the fact that most Bhutanese farmers at present are illiterate and unaware of any technical needs except their immediate duty to support their families and earn their livelihood with as little disruption as possible. In addition they are used to the system of development through trickle down effects. They take the knowledge and skills of the technical personnel for granted and make no critical comments. However, in developing the following competencies what little contribution they made has been included.

In general, job competencies needed by VFS in the field can be divided into two broad learning categories. They are as follows:

1. Veterinary science and animal husbandry
2. Extension methods

6.2. Competence in Veterinary Science and Animal Husbandry

The VFS require competence in:

6.2.1. diagnosing common diseases in various species

6.2.2. treating diseases diagnosed in 6.2.1.

6.2.3. the proper use of drugs (e.g. administration, dose and route)

6.2.4. performing minor surgical operations

6.2.5. the administration of anaesthetics

6.2.6. carrying out prophylactic treatment

6.2.7. scheduling and carrying out deworming of livestock

6.2.8. carrying out post mortem inspection (e.g. marketed meat, and animals with diseases of veterinary importance)

6.2.9. advising farmer and other clients on zoonotic diseases

6.2.10. breeding and reproduction of domestic animals

6.2.11. carrying out laboratory diagnosis of common diseases prevalent in the area

6.2.12. husbandry and management of livestock

6.2.13. computing and advising farmers on feed and feeding of livestock

6.2.14. maintaining proper records of the routine work

6.2.15. carrying out pasture development and establishment

6.3. Extension methods

The VFS require competence in:

6.3.1. various methods of contacting farmers

6.3.2. demonstrating innovative programmes, organisation of meetings, field trips and tours

6.3.3. identifying farmers of varying capabilities

6.3.4. taking messages from immediate supervisors to farmers and vice versa

6.3.5. liaison between government and farmers and vice versa

6.3.6. bringing awareness of innovations to the farmers

6.3.7. implementing the by-laws of the Department

6.3.8. reporting progress in a format suitable to the department

6.3.9. identifying the constraints in carrying out development activities

6.3.10. using a variety of visual aids

6.3.11. constructing various inexpensive aids for field use

6.3.12. carrying out small scale research

These were the main job competencies required by field staff under the DAH. In future the needs will certainly alter or additional competencies will be required because of the dynamic nature of the development activities. Thus some form of flexibility in the curriculum will be needed to meet this demand. To perform these competencies, knowledge and skills will be required. It is beyond the scope of this thesis to comprehensively cover all of these. However, one of the job competencies is fully described here and a sample CBT curriculum designed and developed as an example.

The principal competence in 6.2.4. (i.e. performing minor surgery) has been chosen to show how under CBT the job is broken down and developed into task competencies. The

necessary knowledge and skills were then identified for these tasks. The skills and knowledge training will help the future trainees of the RVI to develop job-fitting competency.

6.4. Curriculum design for the subject-surgery

The job competencies in surgery will require various learning tasks. The overall goal is as follows:

The trainee will be able to restrain and anaesthetize an animal and carry out minor operations aseptically under field conditions.

Within this overall goal for surgery there are ten terminal objectives. The terminal objectives are to be able to:-

6.4.1. carry out a vasectomy
6.4.2. perform a castration
6.4.3. suture various types of wounds
6.4.4. perform a hysterectomy
6.4.5. remove an abscess
6.4.6. amputate a tail
6.4.7. dehorn an animal
6.4.8. remove various types of tumours
6.4.9. perform surgical correction of mammary gland disorders
6.4.10. perform minor cases of surgical correction of prolapse.

6.5. Skills and knowledge

To reach the terminal objectives of the subject surgery various knowledge and skills are required. The knowledge will provide the essential background to perform the surgery. Skills training will give the necessary practice as well as dexterity in carrying out the tasks required to perform surgery in the field.

6.5.1. Knowledge requirements

1. An understanding of the basic anatomical structures of the organs (e.g. muscle layers, blood supplies, nerve supplies)
2. A knowledge of how the organs involved in the operation function

3. An understanding of drug actions and their side-effects
4. An understanding of drug dosage and various sites of injection
5. A knowledge of the disorders requiring surgery
6. An understanding of the action of anaesthetics
7. A knowledge of the basic concepts in sterilization of instruments
8. A knowledge of the basic concepts in self-sterilization
9. An understanding of hygienic approaches to an operation
10. A knowledge of the different suture materials and needles
11. A knowledge of the concept of properly restraining animals

6.5.2. Skill requirements

The skills required to reach the terminal objectives are competence in:

1. properly restraining the animal
2. identifying the various muscle layers
3. identifying the various blood and nerve supplies
4. identifying the types of anaesthetics to be used
5. calculating the dose rate of the anaesthetics
6. administering the drug through the proper route
7. sterilizing the instruments
8. carrying out self-sterilization
9. preparation of the operative site
10. identifying various instruments used in different operations
11. identifying and using various suture materials and needles
12. incising the operative site according to the size required
13. stopping any bleeding
14. suturing different layers of the tissues
15. removing or operating on the target organ
16. injecting the antibiotics
17. taking post operative care (e.g. applying antiseptics, bandaging, and advising the farmers about the care of a recently operated animal).

The skills and knowledge required to achieve each of the terminal objectives can be grouped. Each skill and knowledge will form a sub-objective. These sub-objectives can be arranged into modules comprising units, which will help to attain the terminal objectives. Since

some of these sub-objectives contribute to each of the terminal objectives in 6.4. they do not have to be repeated every time the terminal objective is taught.

Each terminal objective requires specific anatomy and pathology components which are different because the target organs are different. These specific components will form the entry level competence for each of the terminal objectives.

The modules for the common sub-objectives are formed by:

1. taking the individual or group of sub-objectives and combining them, and
2. grouping them into appropriate techniques.

From the above the following modules are formed. Each module composes one or more sub-objectives. All these modules are required to perform each of the terminal objectives. So a common target of these modules is termed Surgery, denoted by "S" in the course map (Fig. 6.1.). The modules are named according to the techniques as follows:

1. module I - restraining techniques (RT)
2. module II - sterilizing techniques (ST)
3. module III - anaesthetizing techniques (AT)
4. module IV - operating techniques (OT)

Prior to entry into these modules, a trainee will require specific knowledge and skills which are the units in anatomy, pharmacology, and pathology. These are the entry level requirements for surgery. Assuming that a particular trainee has acquired the entry level knowledge and skills, competence in surgery will require each of the following modules. The letters (RT1, RT2, RT3, etc) indicate the code used in the course map and the student progress sheet.

Module I: Restraining Techniques (RT)
Objectives: A trainee needs to be able to:

1. approach animals without getting hurt (RT1)
2. select various equipment required for restraining animals (RT2).
3. explain various methods of restraining animals (RT3).

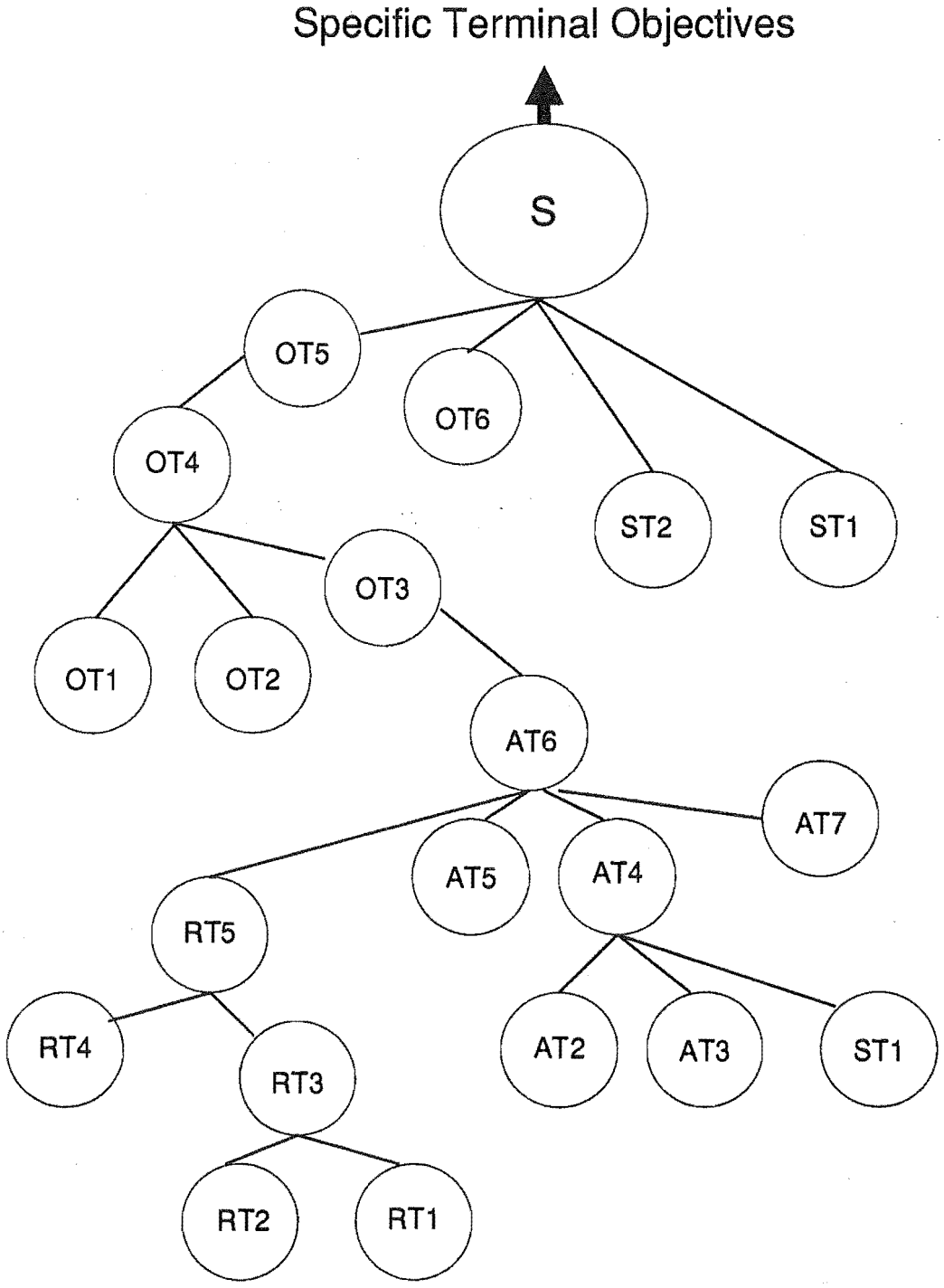


Fig.6.1. The course map for the subject surgery

4. perform atleast three different methods of restraint (RT4).
5. cast animals without injury to the animals or to colleagues (RT5).

Module II: Sterilization Techniques (ST)

Objectives: A trainee needs to be able to:

1. sterilize various instruments (ST1).
2. aseptically prepare the site of the operation (ST2).
3. sterilize self before and after the operation (ST3).

Module III: Anaesthetizing Techniques (AT)

Objectives: A trainee needs to be able to:

1. use various anaesthetics available in the field (AT1).
2. use various anaesthetics at the correct dose and rate (AT2).
3. inject anaesthetics through the proper route (AT3).
4. detect reflexes during induction and recovery stages (AT4).
5. detect when the animal is induced completely (AT5).
6. treat anaesthetic overdose (AT6).

Module IV: Operating Techniques (OT)

Objectives: A trainee needs to be able to:

1. identify correct suturing materials for a specific site (OT1).
2. identify correct needles for a specific suture (OT2).
3. incise the operative site (OT3).
4. remove and/or correct organs being operated (OT4).
5. suture the wound (OT5)
6. take post operative care (OT6).

Table 6.1. Overall curriculum design for the course of surgery.

Module Code	Objective	Teaching Methods	Teaching resources	Assessment
Be able to:				
RT1	approach animal	lecture, practical observation of animals	farm animal, hand-outs, photographs, animal behaviour text-books, and over-head projector	observation of student performance with check-lists and written test
RT2	select various equipment	demonstration, laboratory, photographs and lecture	text-books, over-head projector, slides, ropes twitches, nose-rings etc.	check-list and student performances
RT3	explain various methods of restraining	lecture and demonstration	text-books, hand-outs, video, photographs, chalkboard	oral and written test
RT4	perform 3 different methods of restraints.	demonstration and video	video-film, farm animal, ropes, text-books, chutes, chalk-board or over-head	oral and performance through check-list
RT5	cast an animal	demonstration and video	text-books, chalk-board, ropes,farm animal, veterinary hospital	performance check-list
ST1	Sterilise instruments	lecture and laboratory	water heater, forceps, needle, blades, scissors, trays, gloves, text-books and hand-outs.	written and practical
ST2	prepare operation site	lecture and demonstration	text-books, antiseptic soln., hand-outs, blade, scissors.	performance check-list
ST3	sterilise self	lecture and demonstration	hand-outs, soap, water, and gloves.	performance check-list

AT1	identify anaesthetics	lecture and practical	hand-outs, over-head projector, anaesthetics.	written and performance check-list
AT2	use in correct dose and rate	lecture, calculation and demonstration	chalk-board, handouts, animals, needle and syringes.	written and oral tests
AT3	detect reflexes	lecture and demonstration	hand-outs, text-books, stray-dogs and/or farm animals.	performance check-list
AT4	tell when animal is induced	lecture and demonstration	anaesthetics, farm animals, needles and syringes, hand-outs, overhead projector.	performance check-list
AT5	treat anaesthetic over dose	lecture and demonstration	text-books, hand-outs, animal, anaesthetics, antidotes, needles and syringes.	written and oral
OT1	identify various suturing materials	lecture and laboratory	various sizes of catgut, nylon, books, hand-outs, overhead projectors.	performance check-list
OT2	identify various suturing needles	lecture and laboratory	suturing needles, text-books, hand-outs, chalk-board.	performance check-list
OT3	incise operative site	lecture, demonstration and simulation	scalpel blades and handle, dummy or dead animal, text-books and chalk-board	performance check-list
OT4	remove and/or correct organs being operated	lecture, demonstration and simulation	animal, scissors, forceps, dummy or models, text-books, hand-outs.	performance check-list
OT5	suture the wound	lecture and demonstration	needles, sutures, forceps, text-books, photographs, overhead projectors, animal	performance check-list
OT6	take post operative care	lecture and demonstration	operated animal, text-books, veterinary hospital, handouts	performance check-list

The modules above are then arranged into a flow chart as a subject map. The subject map shows the link between the modules. The course map does not, however, provide a teaching sequence. Depending on the availability of the resources and personnel any of the modules could be taught first. In the case of the RVI it is likely that the whole subject curriculum would be taught by one trainer. The trainer has the choice of teaching any of the modules depending on the resources at hand and his/her professional skills and experience to select the appropriate teaching sequence.

The curriculum design chart is attached as Table 6.1. This shows the module code, objectives, teaching methods, resources to be used and how the assessment is to be carried out. This lay-out will help the trainer in arranging resources, dispensing knowledge and skills and assessing students.

6.6. Sequencing

A systematic approach to instruction will be discussed here. Any of the modules can be taught first. Within a module each trainee must must follow the linkage on the subject map. Each unit must be completed before the next may be attempted. If a trainee fails to complete the unit (s)he will not be allowed to proceed to the next unit. The completion of a unit will be shown on the progress sheet (see Table 6.2.) obtained from the subject map. This progress sheet will show how the trainee is progressing and whether the trainer has to give additional help.

A trainer provides each trainee with:

1. objectives and the module code of the subject .
2. personal progress sheet.
3. assessment procedure.

In addition to the above, the trainer prepares all the hand-outs required and informs trainees about additional references. Each trainee will submit their work or ask for the appropriate (oral, written or practical etc.) assessment whenever they feel competent.

Table 6.2. Progress sheet for the students

Personal Progress Sheet

Module Code	Objectives	Date Achieved	Sign off
Restraining Techniques			
RT1	approach the animal		
RT2	select equipment		
RT3	explain various methods of restraining		
RT4	perform 3 methods of restraint		
RT5	cast the animal		
Sterilization techniques			
ST1	sterilise instrument		
ST1	prepare operative site		
ST2	sterilise self		
Anaesthetizing techniques			
AT1	select anaesthetics		
AT2	in correct dose and rate		
AT3	inject anaesthetics		
AT4	detect reflexes		
AT5	tell when induced		
AT6	treat anaesthetic overdose		
Operative techniques			
OT1	identify suturing materials		
OT2	identify suture needles		
OT3	incise operative site		
OT4	remove and/or correct		
OT5	suture wound		
OT6	take post-operative care		

Table 6.3. Performance check-list for module code RT1.

Performance check-list

Module code: RT1

Objective: To be able to approach an animal correctly.

Practical

Items to be checked	Performance	
	Competent	Not yet competent
walked from the correct side	_____	_____
talked to the animal	_____	_____
groomed the animal	_____	_____
carried the restraining equipment correctly	_____	_____

Written Evaluation

Choose 5 correct ways of approaching an animal from the list of 10 given below.

1. walk from the back
2. approach with a stick
3. talk to the animal
4. shout when you approach
5. show the equipment
6. hide the equipment
7. hit the animal
8. groom the animal
9. pat the animal gently
10. walk from the front

OR

List 4 ways of approaching an animal and describe each one in not more than 5 sentences.

OR

Given a list of animals and possible ways of approaching, write which approaches are suitable for each species. (list provided)

6.7. Assessment method

Assessment in CBT is based on criterion-referenced instruction (see chapter 2 section 2.5.2). Assessment in this training system aims firstly to provide immediate feedback to trainees and secondly to assess the trainee on each unit and eventually the whole course.

CBT does not rely solely on a written test but can be assessed in many ways. Depending on the knowledge and skills to be tested, different approaches can be used. Knowledge can be tested through role playing, written work, simulations, or case studies. With skills testing, the actual performance of trainees in situations similar to their future workplace needs to be checked. In whatever form the test is taken, the test items need to be clear, and to match with the objectives and standards identified by the examination board (Mager, 1973; Mager, 1975; Pipe, 1975; Mager & Pipe, 1983)). The standard can be in quantity, time or quality (Posner & Rudnitsky, 1986; Department of Industrial Relations, 1989). A checklist has to be produced for every test item (Oen, 1985; Cantor, 1988; Smith and Merchant, 1990). According to their performance trainees are either graded as "competent" or "not yet competent". Those not yet competent will repeat only those items they have failed to perform and not the whole course. The performance checklist and written assessment for module code RT1 has been constructed as an example (see table 6.3.).

6.8. Overall training components of RVI

The above course curriculum considers only pre-service training. From the survey result reported in this thesis it is clear that the VFS will require induction/orientation courses and in-service training. The induction/orientation course is required to acquaint the new VFS recruits with the working conditions in the field prior to taking up their posting. This could be undertaken based on the needs analyses carried out in section 4.6.

The in-service training is needed to meet the changing demands of the field. To meet this it seems appropriate to conduct in-service training every year for those VFS who have served for at least three years. The in-service training will provide a means to refresh previous knowledge and upgrade the VFS with the new knowledge and skills required. These will need to be identified by field analysis so that appropriate field needs could be provided. The in-service training alone may not be sufficient when the job competencies of an officer are to be changed as a result of promotion. This may demand additional skills and knowledge because of the new

and/or additional responsibilities. Therefore an up-grading course in addition to the in-service training needs to be provided for the VFS prior to or soon after the promotion. The upgrading course will have to be conducted on the basis of the new job descriptions. Thus the overall training system in the RVI will form a 3-tier system as in Fig. 6.2.

The pre-service training will remain as the main body of the training system, but it is essential to provide an induction/orientation course for new recruits, in-service training and the upgrading courses if the VFS are to perform their job competently and meet the changing demands of the field. The latter two are essential because Bhutan lacks the facilities for the provision of technical information in field conditions. Thus in-service training is the only means to keep the VFS technically competent and up-to-date with information. Upgrading courses will be required to help the promoted VFS meet the challenges of the new jobs.

Any training to be conducted will have to be on the basis of actual field needs. It need not be conducted just because funds are available or at the whim of someone who thinks training is required. In so saying, I mean to stress the importance of the identification of the actual field needs so that any training provided will be effective and efficient to counter the emerging field problems.

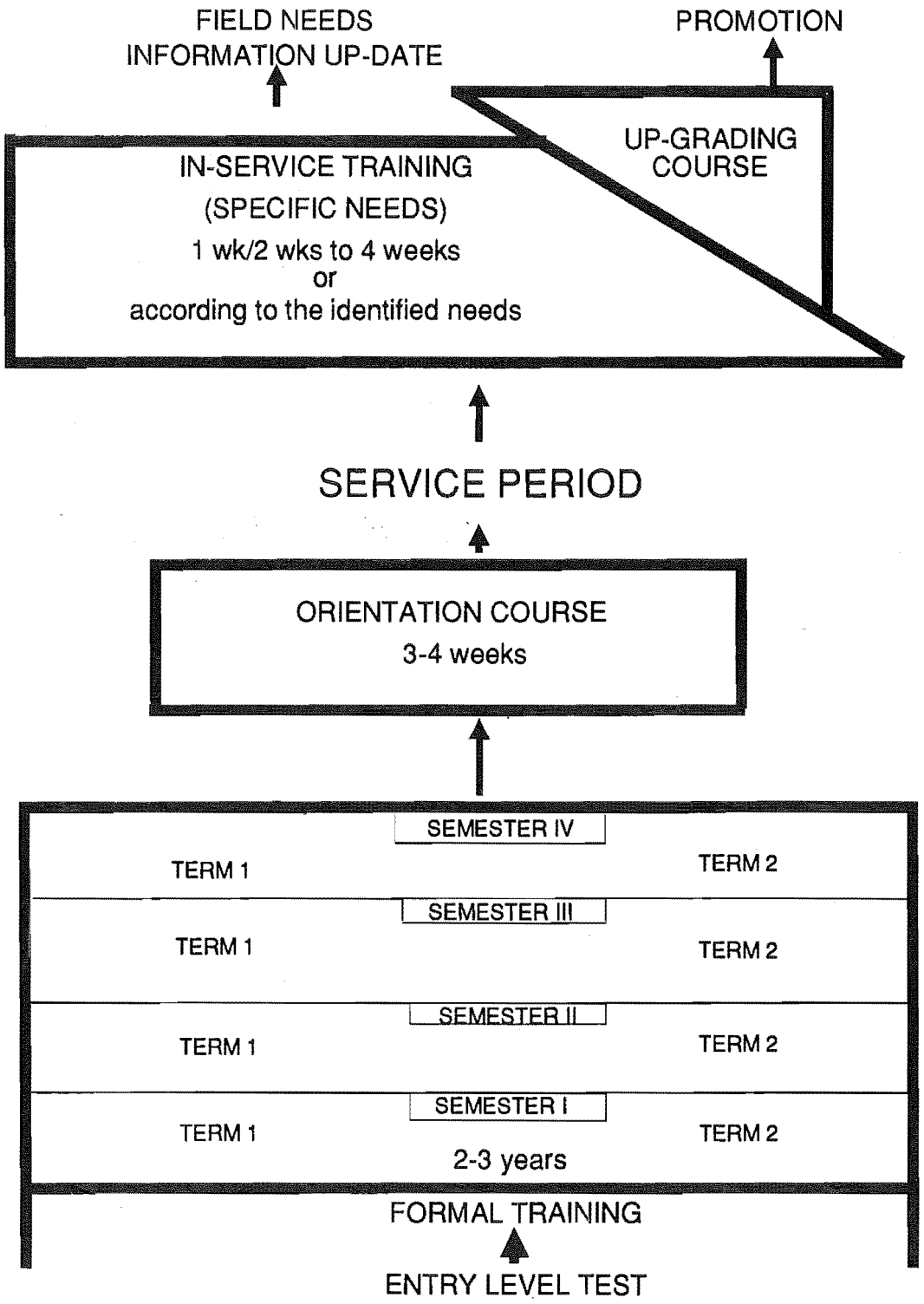


Fig.6.2. Overall training components of the RVI

Chapter 7

General Discussion

7.1. Implications of Competency-Based Training on the RVI

7.1.1. Change in teachers' attitudes

The teachers of the RVI are posted on the basis of their technical qualifications and they do not possess much knowledge or skill in training. If CBT is to be instituted, teachers will require some basic training in job analysis and the setting of well defined objectives. This means teachers' roles will not only be teaching but also constructing a training design system suitable for field requirements. If teachers have to construct a training system, then they will spend a considerable amount of time planning and designing the course. Designing a job related training system will not alone make the CBT successful.

To be successful the competency-based training for teachers must change their outlook toward the whole training system and the students. The attitude of the RVI teachers towards students often arises from the teachers' unwillingness to accept students' experiences. They assume that students know nothing or very little. So teachers often present instruction regardless of students' experiences and the job needs. Consequently, this leads to information overload and very little learning. The CBT will not allow this because it works from a needs analysis and meeting the needs through pre-set objectives (see sec. 2.2, Norton *et al.*, 1980). The CBT also encourages individualised and self-paced instruction. Hence the teachers will need to encourage students to seek help more often than at present. This can result only from breaking some of the barriers between the teachers and the taught.

The well accepted norm of the teacher as the "know-all" person in the teaching arena will have to be changed. The RVI teachers will have to view themselves as facilitators, instructors and managers rather than as teachers (Davies, 1973; Mager & Pipe, 1983, section 2.7). They will need to encourage students to be more curious, exploratory and enthusiastic in their learning. To do this will mean breaking the cultural barrier of accepting the teachers as the "know-all" person by the students and of teachers being in rigid on their authority. This can be brought about by allowing students the freedom to express and discuss issues and topics in class. On the other hand, a teacher will have to open himself to students, as the students are culturally shy. The

teachers will need to make the environment conducive to learning by encouraging the students to ask questions and making the training a sharing of ideas rather than a teacher's show. The teachers can bring this into play by nurturing the trainees to discuss, simulate, use role-play etc. in their learning activities (Sheal, 1989, p11-29).

This conducive learning environment can only be achieved by breaking another rigid cultural barrier and rewarding the students for learning. The reward in terms of encouragement and motivation will have to be explored. Punishment for failure to learn needs to be removed. Punishment may lead to the neglect of learning (Mager & Pipe, 1983). CBT has a substantial psychological basis (see sec. 2.4.1, Blank, 1980) and it would help RVI teachers to build up a good learning environment. Moreover, CBT if instituted, will encourage a trainer to use all the senses of students. This is important, as Geoffrey Moss (1987) writes that a student learns 83% by sight, 11% by hearing and 6% by other senses. At present the RVI students use mainly hearing and it seems sensible to use a variety of media in teaching. However, this might mean a bigger budget will be required for training (see section 7.4).

Finally, teachers of the RVI will need to find ways of fulfilling trainees' needs by providing appropriate hand-outs and references. The issue here is not whether the CBT can be implemented but how willing are the teachers are to shift from being lecturers to facilitators, instructors and managers. If they are willing to do so, the RVI will be able to create an environment conducive to learning. This does not necessarily mean that CBT can be easily implemented. The CBT also demands changes in students' attitudes.

7.1.2. Change in students' attitude

The trainees of the RVI are only class X passed (equivalent to Form 4 NZ). The majority of them have been unsuccessful in pursuing their secondary education and they look back on poor learning experiences. Inevitably, they do not take much interest in curricular activities (Gurung, 1990 pers. com.). They are a poorly motivated group who direct their effort to passing the examination. If CBT is instituted, it will either pressurise or motivate the RVI trainees into greater learning involvement because, being individualised, it demands a lot from each trainee (Wilson, 1987b, Norton *et al.*, 1980). This will make the trainees more responsible for their learning than the prevailing condition where a trainee passes out by reproducing a teacher's instruction in an examination. The CBT examines for performance accomplishment through pre-stated objectives. A trainee will have to exhibit his/her competency before moving into the next

unit. As there is a pre-set objective to be accomplished, students will be directed toward attaining this objective which in turn should result in their greater involvement in learning.

A major change that will be required in students is getting over the "fear of authority" or the cultural barrier. Over the years students have looked upon their teachers as the sole dispenser of knowledge and skills. They are tuned to listen and accept instruction from teachers regardless of their understanding. Moreover, they are culturally shy and do not seek much help from teachers unless called upon by teachers. I think the trainees of the future will need to be more open and seek help more often from their teachers. They will need to accept learning as a sharing of ideas and not simply taking notes in the class and memorising them for examinations. This attitude change towards learning will not only help make the training successful but will foster in them a zest for life-long continuing education because of the favourable learning experiences. The CBT brings this about by individualised and self-paced learning.

As CBT individualizes and self-paces learning, trainees will need to develop a habit of reading and using references on their own. This will be a positive benefit because it will inculcate reading and referencing habits in trainees. This is vitally important for the field staff in Bhutan because many of them work alone and the only way they consult is by reading their notes and books. This also has implication on budget provision for the supply of library texts and printed materials for VFS field station.

7.1.3. Curriculum implications

A competency-based curriculum implies an integrated instructional program (Davies, 1973; Mather *et al.*, 1978). In the RVI, the course curriculum has been added to over the years without much attention to the relationship with other related subjects (e.g. anatomy is taught separately from the anatomy required in surgery). This results in students viewing these subjects as separate packages and when it comes to applying principles in the field it becomes very difficult for them.

CBT, on the other hand, builds its curriculum on the basis of field needs and task analysis. Once analysis is undertaken, the learning is sequenced so that every step contributes to attaining the terminal objectives. For example, in performing an operation on the tail of a cow the trainer will need to know the anatomy of the tail, the pathological conditions of the tail requiring operation, and the physiology of the tail besides the general surgical procedure (see Chapter 6,

Course map). This will not only help each trainee to know what (s)he is expected to do but also to know what knowledge and skills (s)he will need to use for each case. It is very difficult in the present system because subject integration is not considered necessary and some of the vital steps in performing a task may be lost.

Another positive implication of the CBT curriculum is that the trainees of the RVI will know beforehand what is expected of them because training objectives and assessment are clearly stated.

The main implication of CBT on the RVI curriculum will be the integration of the various subjects required for training. This may mean that some of the existing subjects will remain as an entry level requirements or that some will not exist because the job does not require them.

7.1.4. Assessment implication

A major effect will be on the system of assessment. CBT requires criterion-referenced assessment (see section 2.5). The basic difference is that students will not get grades. They will either pass out as "competent" or remain "not yet competent". In cases of "not yet competent" students they are given remedial instruction until they are competent. (see sec. 2.5.1., Fig. 2.2.B). Since grading is required in the Bhutanese system for posting and selecting the capable trainees the CBT system may not be accepted (Gurung, pers. com., 1990). For this purpose it is suggested that the following procedures could be followed till a time when CBT becomes fully established.

CBT does not lead itself to the separation of students into different grades (e.g. A, B, C and F) (see sec. 2.5.2). If there is no way to avoid this due to administrative or cultural problems then it is possible to use time as a determinant of achievement. The administrative problem arises due to the need for appointment of high achievers in the project areas. The cultural problem comes in the form of praise and social status for high grades among the trainees. In taking time as the determinant of achievement the competency level and attainment of objectives should remain as required by CBT.

Taking the time factor to provide grades will mean the number of modules completed at a particular date could be considered. For example by the end of the semester I, 30th June, 1991, the number of weeks taken by each student to complete the modules is computed and the respective grades are given according to that time scale.

For example, if the units RT1, RT2, RT3, RT4 and RT5 were to be completed by semester I, then the time taken by each student to complete each unit would be computed into a numeric score with a final grade allocated based on the mean score according to the following table:

Scale:

1.	within 1 week	A	75 and above
2.	up to 2 weeks	B	65 - 74
3.	up to 3 weeks	C	55 - 64
4.	up to 4 weeks	D	45 - 54
5.	More than 4 weeks	F	44 and below

Student	Units and sign off in weeks					Final grade awarded from scores for each unit
	RT1	RT2	RT3	RT4	RT5	
Sonam	1 wk	2 wks	1 wk	3 wks	4 wks	C
Ugyen	2 wks	1 wk	3 wks	1 wk	1 wk	B
Pema	1 wk	1 wk	1 wk	1 wk	1 wk	A
Tashi	4 wks	2 wks	3 wks	3 wks	4 wks	D
Lamo	3 wks	3 wks	2 wks	3 wks	3 wks	C

Fig. 7.1. Grading of students on the basis of time taken to completed units.

In this grading system the students are being awarded for being fast. Speed need not be the sole criterion in judging students. Moreover, some students may get into trouble because modules may stack up by the end of the semester or they may work too quickly and carelessly. There could be an element of danger in rushing their work. This could be prevented to some extent by keeping the criteria in the objectives clear.

Another method could be to take into consideration the number of repeats per unit. This would measure the quality of their work. For example, students could be graded by counting the number of repeat attempts per unit needed to achieve the competence level:

Scale:

Repeat	Grade
0-1	A
2-3	B
4-5	C
above 6	F

Fig.7.2. Grading the students on repeat attempts.

In this system accuracy is being considered. No account is taken of slow learners which CBT accomodates by providing individualised and self-paced learning (Drummond, 1981; Norton *et al.*, 1980) and they are being rewarded for quality learning.

A third possibility is to combine the above two and plot modules completed against repeats (Fleming, 1991, pers. com.). This will take into consideration both the speed and the accuracy components of a learning activity. The final lay-out of this assessment will look as in Fig. 7.3. In this, the individual student's progress is plotted and the average grade can be obtained. Thus a student passing out will have grades instead of the "competent" or "not yet competent" on his/her mark sheet. Using this grading system will require fixing the due dates for the completion of each module. This is still an unacceptable characteristic of CRI (see section 2.5.2. para. 2) but it may be necessary to meet the administrative and cultural needs of the Bhutanese system of training. Fig. 7.3. shows the students' progress sheet for module M1. Their grade can be calculated by getting the mean of both the grade in time and the grade in repeats.

The following shows the grades obtained by each student (denoted in the circle in Fig. 7.3.) for module M1 with due date at 1 week from the end of instruction. In using this system it needs to be remembered that the performance level is fixed in the objectives and if they cannot attain the performance level they will be made to repeat.

S = Handed in module 1 correctly on due date and reached the competence level with one repeat. Grade = A

P = Handed in module 1 on week 1 and reached the competence level with one repeat. Grade = B.

B = Handed in module 1 on the second week and reached the competence level after 3 repeats. Grade = C

K = Handed in module 1 on week 3 and reached the competence level after 3 repeats. Grade = D.

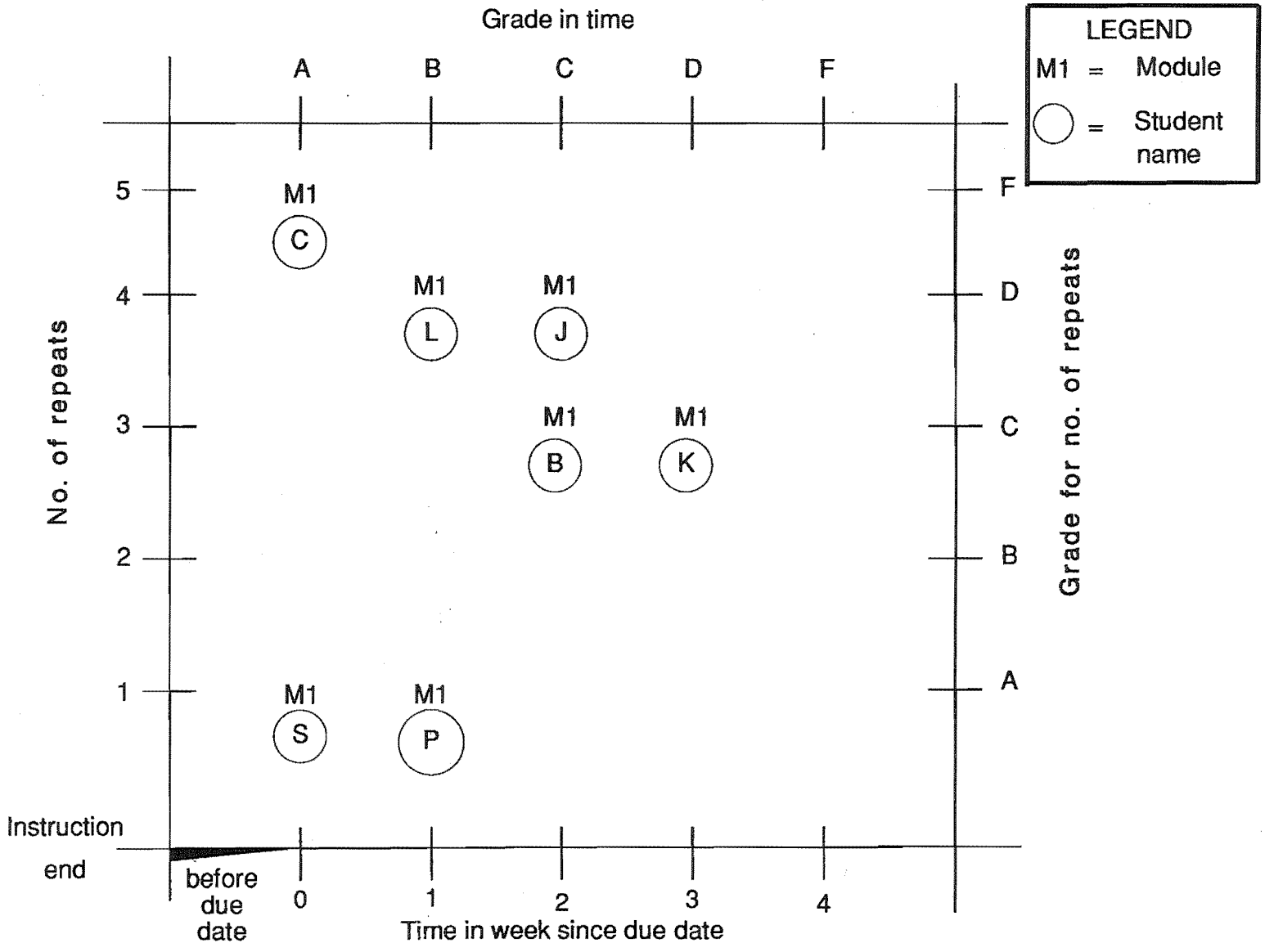


Fig. 7.3. Grading of student achievement against time and repeats

J = Handed in module 1 on week 2 and reached the competence level after 4 repeats. Grade = D.

L = Handed in module 1 on week 1 and reached the competence level after 4 repeats. Grade = C

C = Handed in module 1 on due date and reached the competence level after 5 repeats. Grade = C. (an extreme case has been consider to show the possibility of the repeats)

The grade marks will need to be agreed and detailed by the examining board. Once it is agreed, marks can be allocated against each grade, say:

A = 75 and above
B = 65 - 74
C = 55 - 64
D = 45 - 54
F = 44 and below

After a consensus on mark allocation among the examining board has been reached, a student's grade can be calculated. For example, the grade for student K can be calculated from Fig. 7.3. and the grade given as below:

student K	Time		Repeat		Average mark	Final grade	Final mark
	Mark	grade	mark	grade			
	45	D	55	C	45 +55/2	D	50

Fig. 7.4. The calculation of a grade for student K.

7.1.4. Financial implication

RVI's budget for stationery and teaching aids will need to be increased. However, there is no need for substantial increases if teachers and students use them cautiously. The CBT uses a

wide variety of teaching aids and a recurring budget will be required to operate this. Some increases in budget will be required but further investigation is needed to determine the amount.

7.2. Implementation of CBT in the RVI

7.2.1. Trainee preparation

Implementation of the CBT will require substantial preparation by the trainees (Wilson, 1987b; Maginn, 1978). The basic preparation of trainees will be in terms of orientation to the CBT system. The trainees of RVI will need to be given some time to adapt to the system as it is tried for the first time in Bhutan. During this phase the students will need to be briefed on the system as a whole, how they will approach and attain the objectives, and on their assessment methods.

7.2.2. Administrators and trainer colleagues

Convincing the administrators will be easy because all are aware that a better training system is required. Moreover, with Bhutan being a developing country, better training tools are vitally important. This, compounded with shortage of man-power, forces the administrators look for better ways of training. As CBT seeks to meet the needs of the trainees at their workplace the administrators will view it as having potential for use in the country. Moreover, what Bhutan needs at present is a technical support cadre which is competent to perform the jobs assigned to it. In this respect CBT seems more advantageous than the present system as it can actually measure the trainees' performance when entering the field (see sec. 2.3.2.). Trainers on the other hand will be a bit skeptical because the CBT training basically relies on the task analysis. The task analysis may be viewed as being too narrow an approach to training as the knowledge component of learning remains implicit rather than explicit in CBT. Trainers in the RVI are used to delivering book knowledge and overloading the students. They may find that the knowledge component in CBT is less and may not readily accept it. However, if the training is to account for the competence of students, and also to measure the realization of the objectives, then CBT seems to be the best choice available for Bhutan.

An awareness of this among teachers can be achieved by providing workshops or seminars on CBT within Bhutan. This is important as CBT will be used in Bhutan for the first time. This could be carried out in joint venture with other training institutes in Bhutan.

7.2.3. Preparation of CBT curriculum

Preparation of the CBT curriculum begins with the collection of relevant information on field needs. Based on these needs, priorities and sequencing of the tasks needs to be undertaken. Suffice it to say that the RVI trainers will need to commit themselves to long hours of hard work besides acquiring knowledge on CBT to build the curriculum. Constructing the CBT curriculum is a slow, long and energy-demanding process. To build the whole course curriculum of the RVI may take about 1-2 years. In this respect, it is suggested that the curriculum be built in phases.

7.2.4. Provision of resources

CBT emphasises learning from real world situations and the assessment of actual performance. This calls for resources such as drugs, animals and equipment used in the field within the RVI for students to practice. Moreover, teaching resources (e.g. library textbooks, audio-visual aids and ample stationery) need to be readily available. In this regard, it is suggested that a model farm should be started within the RVI for students to gain practice in management, housing and care. Frequent visits to farms and areas where disease occurs will be needed. This will require additional budget provision. The additional budget provision may be large but in the long run it will be outweighed by the production of more competent and socially employable VFS.

7.2.5. Record keeping

A new system of record keeping will be required. It will basically comprise student performance sheets, teaching resources sheets, and a list of references. RVI will have to keep a separate cabinet for each student's performance records according to each module. Teaching resources such as film projectors, slides, video etc. will need to be kept in a separate cabinet so that any teacher requiring the visual aids will easily find them. The students' performance sheets will help to identify the weak students so that remedial training or teaching can be undertaken.

7.3. Results of Competency-Based Training Approach

7.3.1. Teachers

As a result of CBT the teachers of the RVI will be able to create a helpful learning environment for the trainees. They will shift their role from mere lecturer or information-provider to facilitators, instructors and managers. They will be able to analyse the job requirements and give instructions relevant to needs in the field. Moreover, the teachers of RVI will be able to provide well defined learning as compared to the present system because of the pre-defined objectives and provision of the outline of the course (see sec. 2.6. para. 8). Thus the teachers will be in a position to provide quality training, unlike the prevailing system of overloading the students with too much information of doubtful relevance to field needs.

7.3.2. Trainees

The trainees will open up and actively get involved in learning because of the course requirements. They will develop an urge to seek and explore learning materials, as they will constantly need to refer to and seek help from their teachers and resource packages to fulfill the objectives. Finally, CBT will help produce students who are responsible and competent to perform their job as the learning is self-centered and competence is tested at every stage of training.

7.3.3. Side-effects

One of the obvious side-effects of CBT can be procrastination. If a full-fledged self-paced instruction is carried out, some of the students may take a longer time to complete the course because education is free in Bhutan. Besides it being free, the trainees are paid a stipend. These factors coupled with poorly motivated students may result in negligent study habits. This is my personal view and further study into this is recommended.

Another side-effect of CBT may arise because trainers are unable to carry out curriculum development on the basis of the field requirement. This may lead to the illusion that our trainees are competent to perform the job while they have actually not been trained.

7.4. Conclusion and Recommendation

The following conclusions and recommendations can be made as a result of this study.

1. A survey of VFS in Bhutan needs to be administered through the immediate supervisors. This would help in obtaining a better return rate.

2. The majority of the VFS have only a one year certificate although many of them are in the post of VI. The VFS are young and mainly happy about their field posting. It is recommended that sub-stations in future be built near a road and/or school (see section 5.2., para. 5).

3. Training of the VFS abroad has been a major part of the man-power development process. In future with the increase in qualified man-power and improved facilities in the institute this could be reduced.

4. The three main daily activities of the VFS at present are prevention and treatment, surgical cases and extension activities (sec. 4.2).

5. The subject areas requiring more emphasis in descending order of priority are extension, medicine, anatomy and physiology (sec. 4.2.2. & 5.4.)

6. A more detailed study on the ability to perform disease diagnoses needs to be carried out in future. From this study however, the VFS seemed to be more competent in diagnoses of common species such as cattle, poultry, and pigs. There are a few who did not feel competent in these species (sec. 4.2.3.). A recommendation is made to provide a short training prior to transfer from one region to the other (sec. 5.5., para. 4).

7. The majority of the VFS felt themselves competent in performing a supervisory role. However, in the detection of problems they were poor. Therefore training in analysing problems is indicated (sec. 4.3. & 5.6).

8. The majority of the VFS were competent in carrying out their daily activities of treatment and disease diagnosis. A few did not feel much confidence in advising the farmers on resource availability. Hence it can be suggested that some sort of training needs to be provided in this area (sec.4.4.).

9. Communication through written and visual aids was poor. An efficient system of training in these areas needs to be built into extension methodology (sec. 4.5. & 5.8.).

10. An induction/orientation course needs to be conducted prior to the VFS placement in the field. This would help them to settle into their job. It is recommended that a short duration course of 3-4 weeks be conducted for every passing-out batch (sec.4.6. & 5.9.).

11. A continuous link between the VFS and the RVI staff needs to be established. This would benefit both the institute and the field staff. It is recommended that a system to foster this link be established. (sec. 4.7. & 5.10.).

12. In-service training is the only way in keeping the VFS up-to-date with information in Bhutan. It seems necessary to conduct in-service training annually for those who have served at least 3 years after passing out of the institute. Any training conducted will need to be based on the requirements of the field (sec.4.8.5. & 5.11.).

13. The in-service training needs to be conducted only during low field activity periods. Prior to conducting the in-service training, the target group characteristics need to be thoroughly studied. This will help in constructing instructional materials appropriate to the group. The practical aspects need to be given more stress than the theoretical aspects (sec 4.8.3. & 5.11.1.).

14. The VFS felt their learning experiences in RVI were only reasonable. This leads to the conclusion that there is a need to improve the curricular activities in RVI (sections 4.9.1. and 5.12).

15. The opinion of VFS on RVI as an institute was poor to reasonable. The most salient features governing their opinion were poor hostel, social activities, classroom, use of visual aids and library facilities. Since these help in creating an appropriate learning environment, there is a need to improve them (sections 4.9.2, 5.13, and 5.14).

16. Changes required for the RVI to undertake were the improvements in facilities stated in 16 above. The survey also indicated that the teaching and teachers' attitude need to be changed. Some planning and policy matters had to be altered (section 4.10 and 5.14).

17. The additional skills and knowledge requirements were proper diagnosis, animal management and husbandry and new drugs in veterinary aspects, and the organization of co-operatives and proper use of audio-visual aids in extension methodology. An understanding of the functions of the various gewogs, dzongkhags and zones were needed in organizational aspects. (sec. 4.11. & 5.13).

18. There is a need to change teachers' attitude towards the students and the students' attitude towards learning in RVI if a CBT system is to be instituted in RVI (sec. 7.1.1. & 7.1.2.).

19. CRI-assessment may require some adjustment till the time the CBT system is completely understood by the authorities and the teacher colleagues in Bhutan. It is recommended to use one of the three options provided in sec.7.1.4.

20. The CBT-system will bring about positive attitudinal changes among the teachers and students in Bhutan. However, some financial increase may be required for successful implementation of the CBT-system. Further study into the matter is recommended.

21. A CBT-system will help RVI to build a systematic training system and training will be more accountable as every student passing out will have met the pre-defined objectives of the curriculum.

22. The RVI will basically have to carry out three types of training: (1) pre-service training, (2) an induction/orientation course (3) in-service training coupled with up-grading courses. This 3-tier system of training will help the VFS to settle into their job and keep up-to-date with the information requirements in the field. The up-grading course will aid in harnessing the new competencies required in case of a promotion (sec. 6.8.).

23. Finally, the CBT-system of training will have a tremendous impact on the RVI because it starts from an analysis of field needs and ends with the attainment of pre-stated objectives. Moreover, the CBT system can be built for every subject as shown in chapter 6.

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Appendix I

Holland College's numerical scale of evaluation/assessment

7- can perform this skill without supervision or assistance and can lead others in performing it.

6- can perform this skill without supervision or assistance with initiative and adaptability to special problem situations.

5- can perform this skill without supervision or assistance with proficiency in speed and quality.

4- can perform this skill satisfactorily without assistance and/or supervision.

3-can perform this skill satisfactorily but requires periodic supervision and/or assistance.

2-can perform some parts of the skill satisfactorily but requires instruction and supervision to perform the entire skill.

1-has some knowledge and limited experience, but not sufficient for participation in a work environment.

Appendix II

The covering letters and the survey questionnaire

Lincoln University

Te Whare Wānaka O Aoraki

P.O. Box 84
Lincoln University
Canterbury
New Zealand
Telephone: Christchurch (03)252 811

Fax:
Vice Chancellor & Registry (64)(03)252 965
Library & Departments (64)(03)252 944

11 July 1990

Dear Sir

DR PEMA CHOEPHYEL

Dr Pema Choephyel is a post-graduate student at Lincoln University, New Zealand. He is undertaking his thesis field work at home, in Bhutan, and will then return to New Zealand to analyse the data and write up the information.

We believe his thesis topic will provide valuable information for members of the Royal Government of Bhutan's Animal Husbandry Department. By completing the attached questionnaire you will not only help the objectives of the Royal Government of Bhutan, but also materially help Dr Choephyel produce a worthwhile thesis. I know we can rely on your co-operation.

Thank you in anticipation of your help.

Yours most sincerely

Graham Tate.

GRAHAM TATE
Director
Education Unit and
Thesis Supervisor

TASHI DELEK

Education Unit
Lincoln University
Canterbury
Date 10/07/90.

Dear respondent,

I have chosen to write a thesis at Lincoln University on "An evaluation of competency based training in the context of the Bhutan, Department of Animal Husbandry animal health officers". This is a part of my masters program.

I have selected this topic to make my study relevant to some of the problems in our training system and to try and meet the needs of the country. It is also hoped that this study will bring about a more effective and efficient system in the department's training programmes. Besides, this evaluation will help identify the areas (knowledge, skills, attitudes) which need to be re-addressed in our training system. In the long run, it is hoped to benefit the animal health officers in the Department so that they are more competent and this will help to solve some of the problems.

An old adage says " many hands make light work". I therefore, request all the field staff to fill in the questionnaires and return them as soon as possible. This will make my work easier and will help understand your problems in the field. In doing so I would like you to give your sincere opinions. I assure you that at no point will any particular person's name be quoted. Your comments will be kept confidential.

Please return the questionnaire to the address below.

Thank you

Yours sincerely,

Pema Choephyel
Royal Veterinary Institute
Department of Animal Husbandry
Post Box 155
Thimphu.

Background Information

These look into your background. Please fill out the questions provided and give your personal comments wherever appropriate. As far as possible please try to answer the questions yourself.

1. Your designation (e.g VFA, VI) _____
2. Number of years in the present post _____
3. Number of years in service _____
4. Please tick ( ) one of the boxes for your age group

20 years and below	☐
21-25 years	☐
26-30 years	☐
31-35 years	☐
36-40 years	☐
40 years and above	☐

5. Sex:

Male	☐
Female	☐

6. I have completed the following course in RVI (exclude in-service)

Type of course ☐ Duration ☐

7. Have you been trained outside Bhutan?

Yes ☐

No ☐

8. If" Yes", please specify

type of course _____

country _____

Length of training _____

9. 3 major technical skills I use in my present job are.

1.

2.

3.

10. Please rate the way you feel about your posting by circling the number on the scale.

1- extremely unhappy
2- not happy
3- neutral
4- very happy
5- extremely happy

Please give reasons for your choice _____

_____

_____

Technical Information

This part of the questionnaire deals with your technical and management skill competence. Your frank opinion will be greatly appreciated.

11. From your field experience, what subject areas do you think need greater emphasis in RVI. Please select by ticking 3 subjects from the list provided. Mark (X) in one of your selections which you think is the most important. If all of your selections are equally important place (X) in all.

Subjects	
1. Anatomy	
2. Physiology	
3. Bacteriology	
4. Parasitology	
5. Virology	
6. Medicine	
7. Surgery	
8. Reproduction	
9. Nutrition	
10. Meat hygiene	
11. Extension	

Others not mentioned above; please specify:

12. How would you judge your ability to perform disease diagnosis?

Use this scale to answer

1 2 3 4 5

not at all poor quite good very good excellent

	Diseases			
Species	Bacterial	Parasitic	Viral	Nutritional
Cattle				
Horses				
Pigs				
Poultry				
Sheep				
Yaks				
Dogs				
Wild animals				

Others not mentioned above, please specify _____

_____

_____

13. Have you ever contacted any RVI staff about your field problems? (diseases, diagnosis, treatments etc.)

Yes ☐

No ☐

Please give reasons for your answer _____

_____

_____

_____

_____

14. Do you think that contact with the RVI staff will help improve your ability to perform better in the field?

Yes ☐

No ☐

Please comment: _____

_____

_____

_____

15. Do you have to perform any supervisory work? (eg farmers or others below your cadre)

Yes ☐ _____ go to Q16

No ☐ _____ go to Q17

16. Please rank your ability to perform each of the following by placing a score in the box.

1	2	3	4	5
not able	poor	good	very good	excellent

organise subordinates' work	
manage your time	
stimulate the interest of subordinates	
help subordinates with technical knowledge	
detect why; when things do not work	

Others; please mention: _____

_____

_____

_____

_____

17. How confidently can you carry out the following work in the field? Please use the following scores to rate your confidence.

1	2	3	4	5
not at all	poor	quite confident	confident	highly confident

diagnose diseases	
treat diseases	
make decisions (carry out vaccinations, implement by-laws etc.)	
advise farmers on the husbandry aspects (housing, hygiene,and care of the animals)	
advise farmers on resources (eg. rural credits, seeds, AI, bulls etc)	

Please write any field activities not mentioned above in which you lack confidence. _____

_____

_____

_____

_____

18. Please rate the following using the scale provided to identify your competence in communication skills.

no competence	minimum competence	competent	high competence
1	2	3	4

write a Kuensel article ☐

write to the farmers ☐

speak to a group of farmers ☐

speak face to face with an individual ☐

use visual aids effectively ☐

Please write any communication skills you use in the field but not listed above which you think are important for you to develop further.

_____

_____

19. Do you think you should have an induction/orientation course before you are sent to the field. Please tick ( ).

Yes ☐

No ☐

20. If "Yes" please give 3 areas in which you feel you should have an induction/orientation course.

1. _____

_____

_____

2. _____

_____

_____

3. _____

_____

_____

Length of induction course _____

21. Have you been to an in-service course conducted by the Department of Animal Husbandry? Please tick ( ).

Yes ☐ ——— please go to Q-22

No ☐

If "No" please go to question 26

22. Show how you felt about your latest in-service course.
Use the scale below.

very poor poor reasonable good excellent
1 2 3 4 5

relevance of course subjects to the field	
co-operation and support of lecturers	
timing of inservice course	
organization of the inservice course	
linkage between theory and practical	
information up-date (technical knowledge)	

Please comment on any other important aspect in this course.

23. List 2 major problems which hindered your learning in the course.

1.

2.

24. How would you have tackled them if you were organizing the in-service course?

25. What three important things did you gain from the in-service course?

26. This part of the questionnaire deals with training in the Royal Veterinary Institute. You may have to reflect on some of the aspects of your learning experiences in this part. Please use the scale below to answer the questions.

very poor 1 | poor 2 | reasonable 3 | good 4 | excellent 5

organization of the subject matter	
organization of the field trips	
appropriateness of the practical	
value of farm visits	
link between theory and practical	

Comments: _____

27. Using the same scale as in Q-26, please rate the following to indicate your opinion on RVI as an institute.

Classroom (space, facilities etc.)	
Teaching quality	
Library facilities	
Range of subjects provided	
Depth of subjects provided	
Hostel facilities	
Social activities	
Use of visual aids in teaching (films, slides, posters etc.)	

Others not mentioned, please specify and make comments: _____

28. Looking back on your time in RVI, please write a few lines indicating the most **important changes** you would like to see in RVI to help future students to gain more confidence in their work.

29. Looking ahead to the changes that are going to occur over your next years of service what additional skills or knowledge training do you think you will need to develop.

THANK YOU FOR YOUR HELP !!!!

Appendix III

Lists of variables, code and ranking of the variables used in analysis

Variable	Code							
Desig	0-3	VI	VC	VFA				
Inpost	0-1	0-5yrs.	6-10yrs.					
Servic	0-5	less than 5 years		6-10 yrs	11-15yrs	16-20yrs	above 21yrs.	
Age	0-5	20 years and below		21-25yrs	26-30yrs	31-35yrs	36-40yrs	40yrs
Sex	0-1	Male	Female					
Course	0-1	VI	VFA					
Duration	0-1	1 yr.	2 yrs.					
outside	0-1	yes	No					
type	0-9							
country	0-9							
length	0-1							
Q9	0-99							
Q10	0-5	extremely happy		not happy	neutral	very happy	extremely happy	
Anatomy	0-99							
Physlogy	0-99							
Bactrlgy	0-99							
Paraslgy	0-99							
virology	0-99							
medicine	0-99							
surgery	0-99							
Reprodtn	0-99							
Nutritn	0-99							
Meat	0-99							
Extensn	0-99							
CxB	0-5	not at all		poor	quite good	very good	excellent	
CxP								
CxV								
CxN								
HxB								
HxP								
HxV								

HxN							
PixB							
PixP							
PixV							
PixN							
PoxB							
PoxP							
PoxV							
PoxN							
SxB							
SxP							
SxV							
SxN							
DxB							
DxP							
DxV							
DxN							
WxB							
WxP							
WxV							
WxN							
YxB							
YxP							
YxV							
YxN							
Problems	0-1	Yes		No			
Improve	0-1	Yes		No			
Supervis	0-1	Yes		No			
Oragnise	0-5	not at all		poor	good	very good	excellent
Time							
Interest							
Knowledg							
Detect							
Diagnose	0-5	not at all	poor	quite cinfident	confident	higly confident	
Treat							

Decision						
Husbandr						
Resourse						
Kuensel	0-5	no competence		min. competence	competent	High competence
Farmers						
Group						
Individl						
Visual						
Induct	0-1	Yes	No			
Q19	0-99					
Incourse	0-1	Yes	N0			
Relevanc	0-5	very poor	poor	resonable	good	excellent
Coopratn						
Timing						
Inservic						
Linkage						
Informtn						
Q23	0-99					
Q24	0-99					
Q25	0-99					
Subjects	0-5	very poor	poor	resonable	good	excellent
trips						
Practicl						
Visits						
Link						
Classrm	0-5	very poor	poor	resonable	good	excellent
Teaching						
Library						
Range						
Depth						
Hostel						
Social						
Visaids						
Q28	0-99					
Q29	0-99					